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Department of Defense Fiscal Year (FY) 2024 Budget Estimates

March 2023



Army

Justification Book Volume 2a of 2

Research, Development, Test & Evaluation, Army
RDT&E – Volume II, Budget Activity 4A

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Army • Budget Estimates FY 2024 • RDT&E Program

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RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY
APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$15,772,215,000.00 to remain available for obligation until September 30, 2025.

The FY 2024 Overseas Operations accounted for in the base budget are as follows:

In-theater and in-CONUS expenses that remain after combat operations cease and have been previously funded in Overseas Operations \$3,166,000.00.

COST STATEMENT

The following Justification Books were prepared at a cost of \$365,839.52: Aircraft (ACFT), Missiles (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 1 – Tactical & Support Vehicles, Other Procurement Army (OPA) 2 – Communications & Electronics, Other Procurement Army (OPA) 3 & 4 - Other Support Equipment & Spares, Research, Development, Test and Evaluation (RDTE) for: Budget Activity 1, Budget Activity 2, Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 5C, Budget Activity 5D, Budget Activity 6, Budget Activity 7, and Budget Activity 8.

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FY 2024 RDT&E, ARMY PROGRAM ELEMENT DESCRIPTIVE SUMMARIES
Introduction and Explanation of Contents

1. **General.** The purpose of this document is to provide summary information concerning the Research, Development, Test and Evaluation, Army program. The descriptive summaries are comprised of R-2 (Army RDT&E Budget Item Justification – program element level), R-2A (Army RDT&E Budget Item Justification – project level), R-3 (Army RDT&E Cost Analysis), R-4 (Schedule Profile Detail) and R-5 (Termination Liability Funding for MDAPs) Exhibits, which provide narrative information on all RDT&E program elements and projects through FY 2024.
2. **Relationship of the FY 2024 Budget Submitted to Congress to the FY 2023 Budget Submitted to Congress.** This paragraph provides a list of program elements/projects that are major new starts, restructures, developmental transitions, and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

New Start Programs:

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>Project Title</u>
02	0602146A / AM6	Modular RF Communications Technology
02	0602148A / CI4	Adaptive Avionics Technologies
02	0602141A / CIC	Fire Control Lethality Technology
02	0602182A / DA8	Quantum PNT & Radio Frequency Sensing
02	0602182A / DB4	Enabling Long Standoff 3D (ELS3D) Tech
02	0602002A / DC6	Sci & Analysis for Autonomous Sys & Counter-Auton
02	0602183A / DE2	Airborne Threat Defeat
02	0602150A / DE3	Adv Beam Control Component Development for C-CM
02	0602182A / DE6	Understanding Environment as a Threat Tech
03	0603044A / CW1	Technical-SAVVY Soldier Advanced Research
03	0603116A / DB2	Future Armaments Scalable Technologies
03	0603042A / DB5	Enabling Long Standoff 3D (ELS3D) Adv Tech
03	0603463A / DB6	Pathfinder 3D Advanced Technology
04	0604103A / DG4	NAVMAR SA
04	0603779A / DH6	Installation Resilience
05	0604802A / DC9	30mm MMPA M-SHORAD INC 3

05	0604818A / DD1	Unified Network Technology Trans & Integ (UNTTI)
05	0605206A / DG3	CI and HUMINT Equipment Program-Army (CIHEP-A)
05	0605013A / DH1	Operational Medicine Information System
05	0605216A / EFA	Joint Target Integrated Cmd & Coordination Suite
05	0605036A / EQ5	Combating Weapons of Mass Destruction (CWMD)
05	0605049A / XT4	Advanced Threat Detection System (ATDS)
06	0605601A / WD1	West Desert Test Center
07	0203735A / DD4	AMPV Improvement Program
07	0607315A / DD5	Army Power Systems Modernization

Program Element/Project Restructures:

<u>Budget Activity</u>	<u>Old OSDPE / Project: Title</u>	<u>New OSDPE / Project</u>
02	0602145A / CU5: Next Generation Combat Vehicle Technolog	0602141A / CIA
02	0602181A / CM7: All Domain Convergence Applied Research	0602141A / CIB
02	0602143A / AZ9: Soldier Lethality Technology	0602143A / BB4
02	0602143A / BBG: Soldier Lethality Technology	0602143A / BC2
02	0602145A / BG8: Next Generation Combat Vehicle Technology	0602144A / DG1
02	0602180A / CL7: Artificial Intelligence and Machine Learning Technologies	0602180A / DE8
03	0603040A / CL6: Artificial Intelligence and Machine Learning Technologies	0603040A / DE9
03	0603463A / AR6: Network C3I Advanced Technology	0603042A / DE7
03	0603041A / CM8: All Domain Convergence Advanced Technology	0603116A / CID
03	0603462A / BH6: Next Generation Combat Vehicle Advanced Technology	0603118A / BD9
03	0603462A / BG9: Next Generation Combat Vehicle Advanced Technology	0603119A / DG2
03	0603464A / CZ8: Long Range Precision Fires Advanced Technology	0603464A / AF2
04	0604036A / BY9: Multi-Domain Sensing System (MDSS) Adv Dev	0604036A / DD6
04	0604036A / BY9: Multi-Domain Sensing System (MDSS) Adv Dev	0604036A / DD6

05	0604818A / EJ5: Family of Heavy Vehicles	0604622A / DG7
05	0605224A / CK4: Long-Range Hypersonic Weapon	0604182A / HX2
05	0605224A / CK4: All Up Round and Canister (AUR+C)	0604182A / HX2
05	0605457A / S40: Common Hypersonic Glide Body (CHGB)	0604182A / HX2
05	0605601A / F30: Ground Support Equipment (GSE)	0604182A / HX2
05	0203744A / EB6: HX6: Test and Evaluation	0604182A / HX2
05	0605224A / CK4: Multi-Domain Intelligence	0604805A / 593
05	0605224A / CK4: Multi-Domain Intelligence	0605224A / DD8
05	0605457A / S40: Multi-Domain Intelligence	0605224A / DD9
05	0605601A / F30: Army Integrated Air and Missile Defense (AIAMD)	0605457A / SS1
06	0605601A / F30: Army Integrated Air and Missile Defense (AIAMD)	0605702A / 128
07	0203744A / EB6: Army Test Ranges and Facilities	0305219A / MQ2

Program Terminations (including transfers to Procurement and Sustainment):

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>Project Title</u>
03	0603465A / AI8	Future Vertical Lift Advanced Technology / Alternative Concept Engine Advanced Technology
03	0603463A / AV4	Network C3I Advanced Technology / Foundational S&T for Network C3I Advanced Tech
04	0305251A / DD3	Cyberspace Operations Forces and Force Support / Joint Cyber Warfighting Architecture Cyber Train
04	0604115A / AX8	Technology Maturation Initiatives / Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)
04	0604115A / AX9	Technology Maturation Initiatives / Adv Mobility Experimental Prototype Adv Tech
05	0604802A / CE3	Weapons and Munitions - Eng Dev / Precision Munition (Sniper)
05	0604802A / EU4	Weapons and Munitions - Eng Dev / 40mm HV Improved High Explosive Dual Purpose
05	0604804A / FG4	Logistics and Engineer Equipment - Eng Dev / Ultra-Lightweight Camouflage Net System (ULCANS)
05	0604822A / DV6	General Fund Enterprise Business System (GFEBS) / General Fund Enterprise Business System
05	0604854A / HB6	Artillery Systems - EMD / Mobile 155MM Howitzer
05	0605013A / 184	Information Technology Development / Installation Support Modules
07	0305204A / 11A	Tactical Unmanned Aerial Vehicles / Advanced Payload Develop & Spt

07	0305206A / EH2	Airborne Reconnaissance Systems / EMARSS ADV DEV
07	0305206A / EH3	Airborne Reconnaissance Systems / EMARSS Payloads ADV DEV
08	0608041A / DD2	Defensive CYBER - Software Prototype Development / Joint Cyber Warfighting Architecture Software

3. **Classification:** This document contains no classified data. Appropriately cleared individuals can obtain further information on Classified/Special Access Programs by contacting the Department of the Army.

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Department of Defense
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

<u>Appropriation</u>	FY 2022 Actuals	FY 2023 Less Supplements Enactment		FY 2023 Total Enactment	FY 2024 Request
		Supplements	Enactment*		
Research, Development, Test and Evaluation, Army		14,660,654	17,142,121	9,100	17,151,221
Total Research, Development, Test, & Evaluation		14,660,654	17,142,121	9,100	17,151,221
					15,775,381
					15,775,381

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of Defense
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

	FY 2022 Actuals	FY 2023 Less Supplements Enactment	FY 2023 Supplements Enactment*	FY 2023 Total Enactment	FY 2024 Request
<u>Summary Recap of Budget Activities</u>					
Basic Research	590,078	635,395		635,395	497,455
Applied Research	1,521,472	1,823,330		1,823,330	948,358
Advanced Technology Development	2,145,309	2,532,690		2,532,690	1,455,986
Advanced Component Development & Prototypes	3,799,417	4,631,111	6,000	4,637,111	4,420,315
System Development & Demonstration	3,178,005	4,317,752	600	4,318,352	5,639,364
Management Support	1,901,655	1,820,502		1,820,502	1,624,585
Operational Systems Development	1,416,677	1,286,510	2,500	1,289,010	1,105,748
Software And Digital Technology Pilot Programs	108,041	94,831		94,831	83,570
Total Research, Development, Test, & Evaluation	14,660,654	17,142,121	9,100	17,151,221	15,775,381
<u>Summary Recap of FYDP Programs</u>					
General Purpose Forces	559,789	372,120		372,120	404,375
Intelligence and Communications	262,480	248,995		248,995	212,694
Research and Development	13,733,825	16,382,072	9,100	16,391,172	15,055,009
Central Supply and Maintenance	101,466	132,270		132,270	75,317
Administration and Associated Activities	101				
Classified Programs	2,993	6,664		6,664	27,986
Total Research, Development, Test, & Evaluation	14,660,654	17,142,121	9,100	17,151,221	15,775,381

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

	FY 2022 Actuals	FY 2023 Less Supplements Enactment	FY 2023 Supplements Enactment*	FY 2023 Total Enactment	FY 2024 Request
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Summary Recap of Budget Activities

Basic Research	590,078	635,395		635,395	497,455
Applied Research	1,521,472	1,823,330		1,823,330	948,358
Advanced Technology Development	2,145,309	2,532,690		2,532,690	1,455,986
Advanced Component Development & Prototypes	3,799,417	4,631,111	6,000	4,637,111	4,420,315
System Development & Demonstration	3,178,005	4,317,752	600	4,318,352	5,639,364
Management Support	1,901,655	1,820,502		1,820,502	1,624,585
Operational Systems Development	1,416,677	1,286,510	2,500	1,289,010	1,105,748
Software And Digital Technology Pilot Programs	108,041	94,831		94,831	83,570
Total Research, Development, Test, & Evaluation	14,660,654	17,142,121	9,100	17,151,221	15,775,381

Summary Recap of FYDP Programs

General Purpose Forces	559,789	372,120		372,120	404,375
Intelligence and Communications	262,480	248,995		248,995	212,694
Research and Development	13,733,825	16,382,072	9,100	16,391,172	15,055,009
Central Supply and Maintenance	101,466	132,270		132,270	75,317
Administration and Associated Activities	101				
Classified Programs	2,993	6,664		6,664	27,986
Total Research, Development, Test, & Evaluation	14,660,654	17,142,121	9,100	17,151,221	15,775,381

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

<u>Line No</u>	<u>Program Element Number</u>	<u>Item</u>	<u>Se c</u>	<u>FY 2023 Less</u>		<u>FY 2023</u>	
				<u>Act</u>	<u>FY 2022 Actuals</u>	<u>Supplements Enactment</u>	<u>Supplements Enactment*</u>
1	0601102A	Defense Research Sciences	01	U	358,521	391,642	391,642
2	0601103A	University Research Initiatives	01	U	88,797	107,160	107,160
3	0601104A	University and Industry Research Centers	01	U	122,521	121,160	121,160
4	0601121A	Cyber Collaborative Research Alliance	01	U	5,067	5,355	5,355
5	0601601A	Artificial Intelligence and Machine Learning Basic Research	01	U	15,172	10,078	10,078
Basic Research					590,078	635,395	635,395
6	0602002A	Army Agile Innovation and Development-Applied Research	02	U		1,000	1,000
7	0602115A	Biomedical Technology	02	U	11,489		
8	0602134A	Counter Improvised-Threat Advanced Studies	02	U	1,904	6,192	6,192
9	0602141A	Lethality Technology	02	U	89,285	194,717	194,717
10	0602142A	Army Applied Research	02	U	28,654	27,833	27,833
11	0602143A	Soldier Lethality Technology	02	U	201,221	253,539	253,539
12	0602144A	Ground Technology	02	U	214,489	264,523	264,523
13	0602145A	Next Generation Combat Vehicle Technology	02	U	239,284	277,445	277,445
14	0602146A	Network C3I Technology	02	U	161,759	212,115	212,115
15	0602147A	Long Range Precision Fires Technology	02	U	107,454	128,529	128,529
16	0602148A	Future Vertical Lift Technology	02	U	130,108	104,348	104,348
17	0602150A	Air and Missile Defense Technology	02	U	92,926	88,768	88,768
18	0602180A	Artificial Intelligence and Machine Learning Technologies	02	U	14,486	16,068	16,068

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line <u>No</u>	Program Element <u>Number</u>	<u>Item</u>	<u>Act</u>	<u>Se c</u>	FY 2024 Request
1	0601102A	Defense Research Sciences	01	U	296,670
2	0601103A	University Research Initiatives	01	U	75,672
3	0601104A	University and Industry Research Centers	01	U	108,946
4	0601121A	Cyber Collaborative Research Alliance	01	U	5,459
5	0601601A	Artificial Intelligence and Machine Learning Basic Research	01	U	10,708
		Basic Research			497,455
6	0602002A	Army Agile Innovation and Development-Applied Research	02	U	5,613
7	0602115A	Biomedical Technology	02	U	
8	0602134A	Counter Improvised-Threat Advanced Studies	02	U	6,242
9	0602141A	Lethality Technology	02	U	85,578
10	0602142A	Army Applied Research	02	U	34,572
11	0602143A	Soldier Lethality Technology	02	U	104,470
12	0602144A	Ground Technology	02	U	60,005
13	0602145A	Next Generation Combat Vehicle Technology	02	U	166,500
14	0602146A	Network C3I Technology	02	U	81,618
15	0602147A	Long Range Precision Fires Technology	02	U	34,683
16	0602148A	Future Verticle Lift Technology	02	U	73,844
17	0602150A	Air and Missile Defense Technology	02	U	33,301
18	0602180A	Artificial Intelligence and Machine Learning Technologies	02	U	24,142

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**Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)**

Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line <u>No</u>	Program Element <u>Number</u>	<u>Item</u>	Se <u>Act</u>	FY 2023 Less Supplementals		FY 2023 Supplementals Enactment*	FY 2023 Total Enactment
				C	FY 2022 Actuals		
19	0602181A	All Domain Convergence Applied Research	02	U	25,019	27,360	27,360
20	0602182A	C3I Applied Research	02	U	11,954	27,868	27,868
21	0602183A	Air Platform Applied Research	02	U	6,356	41,588	41,588
22	0602184A	Soldier Applied Research	02	U	10,660	15,716	15,716
23	0602213A	C3I Applied Cyber	02	U	12,119	13,605	13,605
24	0602386A	Biotechnology for Materials - Applied Research	02	U	19,889	21,811	21,811
25	0602785A	Manpower/Personnel/Training Technology	02	U	18,414	19,649	19,649
26	0602787A	Medical Technology	02	U	124,002	80,656	80,656
Applied Research					1,521,472	1,823,330	1,823,330
27	0603002A	Medical Advanced Technology	03	U	147,287	31,588	31,588
28	0603007A	Manpower, Personnel and Training Advanced Technology	03	U	13,865	15,598	15,598
29	0603025A	Army Agile Innovation and Demonstration Artificial Intelligence and Machine Learning Advanced	03	U	21,420	20,900	20,900
30	0603040A	Technologies	03	U	876	6,395	6,395
31	0603041A	All Domain Convergence Advanced Technology	03	U	20,095	45,377	45,377
32	0603042A	C3I Advanced Technology	03	U	3,036	12,716	12,716
33	0603043A	Air Platform Advanced Technology	03	U	727	17,946	17,946
34	0603044A	Soldier Advanced Technology	03	U	858	479	479
35	0603115A	Medical Development	03	U	25,540		
36	0603116A	Lethality Advanced Technology	03	U	7,772	9,796	9,796
37	0603117A	Army Advanced Technology Development	03	U	76,815	134,874	134,874

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No.	Program Element Number	Item	Act	Se c	FY 2024 Request
19	0602181A	All Domain Convergence Applied Research	02	U	14,297
20	0602182A	C3I Applied Research	02	U	30,659
21	0602183A	Air Platform Applied Research	02	U	48,163
22	0602184A	Soldier Applied Research	02	U	18,986
23	0602213A	C3I Applied Cyber	02	U	22,714
24	0602386A	Biotechnology for Materials - Applied Research	02	U	16,736
25	0602785A	Manpower/Personnel/Training Technology	02	U	19,969
26	0602787A	Medical Technology	02	U	<u>66,266</u>
					948,358
Applied Research					
27	0603002A	Medical Advanced Technology	03	U	4,147
28	0603007A	Manpower, Personnel and Training Advanced Technology	03	U	16,316
29	0603025A	Army Agile Innovation and Demonstration	03	U	23,156
		Artificial Intelligence and Machine Learning Advanced			
30	0603040A	Technologies	03	U	13,187
31	0603041A	All Domain Convergence Advanced Technology	03	U	33,332
32	0603042A	C3I Advanced Technology	03	U	19,225
33	0603043A	Air Platform Advanced Technology	03	U	14,165
34	0603044A	Soldier Advanced Technology	03	U	1,214
35	0603115A	Medical Development	03	U	
36	0603116A	Lethality Advanced Technology	03	U	20,582
37	0603117A	Army Advanced Technology Development	03	U	136,280

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Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No	Program Element Number	Item	Se c	FY 2023 Less Supplementals		FY 2023	
				Act	FY 2022 Actuals	Enactment	Supplements Enactment*
38	0603118A	Soldier Lethality Advanced Technology	03	U	148,458	154,639	154,639
39	0603119A	Ground Advanced Technology	03	U	281,637	415,846	415,846
40	0603134A	Counter Improvised-Threat Simulation	03	U	23,920	21,486	21,486
41	0603386A	Biotechnology for Materials - Advanced Research	03	U	51,774	56,853	56,853
42	0603457A	C3I Cyber Advanced Development	03	U	61,426	41,354	41,354
43	0603461A	High Performance Computing Modernization Program	03	U	222,220	301,964	301,964
44	0603462A	Next Generation Combat Vehicle Advanced Technology	03	U	294,491	471,434	471,434
45	0603463A	Network C3I Advanced Technology	03	U	205,576	177,917	177,917
46	0603464A	Long Range Precision Fires Advanced Technology	03	U	138,482	202,830	202,830
47	0603465A	Future Vertical Lift Advanced Technology	03	U	255,323	272,551	272,551
48	0603466A	Air and Missile Defense Advanced Technology	03	U	125,027	99,147	99,147
49	0603920A	Humanitarian Demining	03	U	18,684	21,000	21,000
Advanced Technology Development				2,145,309	2,532,690		2,532,690
51	0603305A	Army Missile Defense Systems Integration	04	U	56,579	118,001	118,001
52	0603308A	Army Space Systems Integration	04	U	25,401	30,945	30,945
53	0603327A	Air and Missile Defense Systems Engineering	04	U	15,000	15,000	15,000
54	0603619A	Landmine Warfare and Barrier - Adv Dev	04	U	44,933	55,953	6,000
55	0603639A	Tank and Medium Caliber Ammunition	04	U	61,641	51,488	51,488
56	0603645A	Armored System Modernization - Adv Dev	04	U	154,010	135,122	135,122
57	0603747A	Soldier Support and Survivability	04	U	2,791	4,060	4,060
58	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	U	113,365	72,314	72,314

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of the Army
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No.	Program Element Number	Item	Se	FY 2024	
			Act	c	Request
38	0603118A	Soldier Lethality Advanced Technology	03	U	102,778
39	0603119A	Ground Advanced Technology	03	U	40,597
40	0603134A	Counter Improvised-Threat Simulation	03	U	21,672
41	0603386A	Biotechnology for Materials - Advanced Research	03	U	59,871
42	0603457A	C3I Cyber Advanced Development	03	U	28,847
43	0603461A	High Performance Computing Modernization Program	03	U	255,772
44	0603462A	Next Generation Combat Vehicle Advanced Technology	03	U	217,394
45	0603463A	Network C3I Advanced Technology	03	U	105,549
46	0603464A	Long Range Precision Fires Advanced Technology	03	U	153,024
47	0603465A	Future Vertical Lift Advanced Technology	03	U	158,795
48	0603466A	Air and Missile Defense Advanced Technology	03	U	21,015
49	0603920A	Humanitarian Demining	03	U	9,068
Advanced Technology Development					1,455,986
51	0603305A	Army Missile Defense Systems Integration	04	U	12,904
52	0603308A	Army Space Systems Integration	04	U	19,120
53	0603327A	Air and Missile Defense Systems Engineering	04	U	
54	0603619A	Landmine Warfare and Barrier - Adv Dev	04	U	47,537
55	0603639A	Tank and Medium Caliber Ammunition	04	U	91,323
56	0603645A	Armored System Modernization - Adv Dev	04	U	43,026
57	0603747A	Soldier Support and Survivability	04	U	3,550
58	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	U	65,567

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Line No	Program Element Number	Item	Se c	FY 2022		FY 2023 Less Supplements Enactment	FY 2023 Supplements Enactment*	FY 2023 Total Enactment
				Act	Actuals			
59	0603774A	Night Vision Systems Advanced Development	04	U	62,534	97,478		97,478
60	0603779A	Environmental Quality Technology - Dem/Val	04	U	22,491	76,749		76,749
61	0603790A	NATO Research and Development	04	U	3,639	3,805		3,805
62	0603801A	Aviation - Adv Dev	04	U	1,138,457	1,157,472		1,157,472
63	0603804A	Logistics and Engineer Equipment - Adv Dev	04	U	10,797	24,638		24,638
64	0603807A	Medical Systems - Adv Dev	04	U	27,768	5,598		5,598
65	0603827A	Soldier Systems - Advanced Development	04	U	25,288	23,444		23,444
66	0604017A	Robotics Development	04	U	78,309	26,555		26,555
67	0604019A	Expanded Mission Area Missile (EMAM)	04	U	26,855	258,320		258,320
68	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04	U		77,000		77,000
69	0604035A	Low Earth Orbit (LEO) Satellite Capability	04	U	18,922	35,509		35,509
70	0604036A	Multi-Domain Sensing System (MDSS) Adv Dev	04	U	50,548	47,915		47,915
71	0604037A	Tactical Intel Targeting Access Node (TITAN) Adv Dev	04	U	28,347	863		863
72	0604100A	Analysis Of Alternatives	04	U	9,723	10,659		10,659
73	0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4)	04	U	892	1,425		1,425
74	0604103A	Electronic Warfare Planning and Management Tool (EWPMT)	04	U				
75	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	U	76,349	134,719		134,719
76	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	U	408,766	380,147		380,147
77	0604115A	Technology Maturation Initiatives	04	U	127,725	219,742		219,742
78	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	U	37,939	274,838		274,838

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Line No	Program Element Number	Item	Act	Se c	FY 2024 Request
59	0603774A	Night Vision Systems Advanced Development	04	U	73,675
60	0603779A	Environmental Quality Technology - Dem/Val	04	U	31,720
61	0603790A	NATO Research and Development	04	U	4,143
62	0603801A	Aviation - Adv Dev	04	U	1,502,160
63	0603804A	Logistics and Engineer Equipment - Adv Dev	04	U	7,604
64	0603807A	Medical Systems - Adv Dev	04	U	1,602
65	0603827A	Soldier Systems - Advanced Development	04	U	27,681
66	0604017A	Robotics Development	04	U	3,024
67	0604019A	Expanded Mission Area Missile (EMAM)	04	U	97,018
68	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04	U	117,557
69	0604035A	Low Earth Orbit (LEO) Satellite Capability	04	U	38,851
70	0604036A	Multi-Domain Sensing System (MDSS) Adv Dev	04	U	191,394
71	0604037A	Tactical Intel Targeting Access Node (TITAN) Adv Dev	04	U	10,626
72	0604100A	Analysis Of Alternatives	04	U	11,095
73	0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4)	04	U	5,144
74	0604103A	Electronic Warfare Planning and Management Tool (EWPMT)	04	U	2,260
75	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	U	53,143
76	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	U	816,663
77	0604115A	Technology Maturation Initiatives	04	U	281,314
78	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	U	281,239

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Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplements	FY 2023 Supplements	FY 2023 Total Enactment
						Enactment	Enactment*	Enactment
79	0604119A	Army Advanced Component Development & Prototyping	04	U	179,483	198,111		198,111
80	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	U	80,858	57,620		57,620
81	0604121A	Synthetic Training Environment Refinement & Prototyping Counter Improvised-Threat Demonstration, Prototype	04	U	198,815	242,468		242,468
82	0604134A	Development, and Testing	04	U	12,891	14,840		14,840
83	0604135A	Strategic Mid-Range Fires	04	U		404,291		404,291
84	0604182A	Hypersonics	04	U	305,406	238,168		238,168
85	0604403A	Future Interceptor	04	U	6,643	8,179		8,179
86	0604531A	Counter - Small Unmanned Aircraft Systems Advanced Development	04	U	18,449	35,110		35,110
87	0604541A	Unified Network Transport	04	U	33,879	36,966		36,966
88	0604644A	Mobile Medium Range Missile	04	U	275,989			
89	0604785A	Integrated Base Defense (Budget Activity 4)	04	U	2,040			
90	0305251A	Cyberspace Operations Forces and Force Support	04	U	55,895	55,599		55,599
999	999999999	Classified Programs	04	U				
Advanced Component Development & Prototypes					3,799,417	4,631,111	6,000	4,637,111
91	0604201A	Aircraft Avionics	05	U	6,411	3,335		3,335
92	0604270A	Electronic Warfare Development	05	U	29,683	4,140		4,140
93	0604601A	Infantry Support Weapons	05	U	77,027	83,329		83,329
94	0604604A	Medium Tactical Vehicles	05	U	9,177	22,163		22,163
95	0604611A	JAVELIN	05	U	8,202	16,186		16,186

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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79	0604119A	Army Advanced Component Development & Prototyping	04	U	204,914
80	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	U	40,930
81	0604121A	Synthetic Training Environment Refinement & Prototyping Counter Improvised-Threat Demonstration, Prototype	04	U	109,714
82	0604134A	Development, and Testing	04	U	16,426
83	0604135A	Strategic Mid-Range Fires	04	U	31,559
84	0604182A	Hypersonics	04	U	43,435
85	0604403A	Future Interceptor	04	U	8,040
86	0604531A	Counter - Small Unmanned Aircraft Systems Advanced Development	04	U	64,242
87	0604541A	Unified Network Transport	04	U	40,915
88	0604644A	Mobile Medium Range Missile	04	U	
89	0604785A	Integrated Base Defense (Budget Activity 4)	04	U	
90	0305251A	Cyberspace Operations Forces and Force Support	04	U	
999	999999999	Classified Programs	04	U	<u>19,200</u>
Advanced Component Development & Prototypes					4,420,315
91	0604201A	Aircraft Avionics	05	U	13,673
92	0604270A	Electronic Warfare Development	05	U	12,789
93	0604601A	Infantry Support Weapons	05	U	64,076
94	0604604A	Medium Tactical Vehicles	05	U	28,226
95	0604611A	JAVELIN	05	U	7,827

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				Act	Actuals			
96	0604622A	Family of Heavy Tactical Vehicles	U	05	27,406	53,014		53,014
97	0604633A	Air Traffic Control	U	05	4,244	2,623		2,623
98	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	U	05		109,849		109,849
99	0604642A	Light Tactical Wheeled Vehicles	U	05	1,980			
100	0604645A	Armored Systems Modernization (ASM) - Eng Dev	U	05	118,296	63,131		63,131
101	0604710A	Night Vision Systems - Eng Dev	U	05	41,831	92,951		92,951
102	0604713A	Combat Feeding, Clothing, and Equipment	U	05	1,598	1,566		1,566
103	0604715A	Non-System Training Devices - Eng Dev	U	05	28,605	18,588		18,588
104	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	U	05	58,633	55,541		55,541
105	0604742A	Constructive Simulation Systems Development	U	05	21,424	29,481		29,481
106	0604746A	Automatic Test Equipment Development	U	05	8,486	5,178		5,178
107	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	U	05	12,182	8,189		8,189
108	0604798A	Brigade Analysis, Integration and Evaluation	U	05	20,976	21,086		21,086
109	0604802A	Weapons and Munitions - Eng Dev	U	05	287,787	285,778	600	286,378
110	0604804A	Logistics and Engineer Equipment - Eng Dev	U	05	49,201	75,669		75,669
111	0604805A	Command, Control, Communications Systems - Eng Dev	U	05	19,372	44,993		44,993
		Medical Materiel/Medical Biological Defense Equipment - Eng						
112	0604807A	Dev	U	05	43,023	5,513		5,513
113	0604808A	Landmine Warfare/Barrier - Eng Dev	U	05	28,622	37,150		37,150
114	0604818A	Army Tactical Command & Control Hardware & Software	U	05	146,291	131,190		131,190
115	0604820A	Radar Development	U	05	124,832	71,259		71,259

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Line No	Program Element Number	Item	Act	Se c	FY 2024 Request
96	0604622A	Family of Heavy Tactical Vehicles	05	U	44,197
97	0604633A	Air Traffic Control	05	U	1,134
98	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05	U	142,125
99	0604642A	Light Tactical Wheeled Vehicles	05	U	53,564
100	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	U	102,201
101	0604710A	Night Vision Systems - Eng Dev	05	U	48,720
102	0604713A	Combat Feeding, Clothing, and Equipment	05	U	2,223
103	0604715A	Non-System Training Devices - Eng Dev	05	U	21,441
104	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	U	74,738
105	0604742A	Constructive Simulation Systems Development	05	U	30,985
106	0604746A	Automatic Test Equipment Development	05	U	13,626
107	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	U	8,802
108	0604798A	Brigade Analysis, Integration and Evaluation	05	U	20,828
109	0604802A	Weapons and Munitions - Eng Dev	05	U	243,851
110	0604804A	Logistics and Engineer Equipment - Eng Dev	05	U	37,420
111	0604805A	Command, Control, Communications Systems - Eng Dev	05	U	34,214
		Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	U	6,496
112	0604807A	Landmine Warfare/Barrier - Eng Dev	05	U	13,581
114	0604818A	Army Tactical Command & Control Hardware & Software	05	U	168,574
115	0604820A	Radar Development	05	U	94,944

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Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplements	FY 2023 Supplements	FY 2023 Total Enactment
						Enactment	Enactment*	Enactment
116	0604822A	General Fund Enterprise Business System (GFEBS)	05	U	15,395	10,402		10,402
117	0604827A	Soldier Systems - Warrior Dem/Val	05	U	6,219	19,408		19,408
118	0604852A	Suite of Survivability Enhancement Systems - EMD	05	U	93,207	100,384		100,384
119	0604854A	Artillery Systems - EMD	05	U	25,000	48,106		48,106
120	0605013A	Information Technology Development	05	U	125,109	104,134		104,134
121	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	U	65,230	67,519		67,519
122	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	U	34,262			
123	0605030A	Joint Tactical Network Center (JTNC)	05	U	15,752	17,936		17,936
124	0605031A	Joint Tactical Network (JTN)	05	U	27,849	30,150		30,150
125	0605035A	Common Infrared Countermeasures (CIRCM)	05	U	15,982	11,523		11,523
126	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	U				
		Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV)						
127	0605038A	Sensor Suite	05	U	7,340			
128	0605041A	Defensive CYBER Tool Development	05	U	18,811	39,029		39,029
129	0605042A	Tactical Network Radio Systems (Low-Tier)	05	U	27,688	4,426		4,426
130	0605047A	Contract Writing System	05	U	20,195	13,742		13,742
131	0605049A	Missile Warning System Modernization (MWSM)	05	U				
132	0605051A	Aircraft Survivability Development	05	U	60,127	19,123		19,123
133	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	U	175,604	131,093		131,093
134	0605053A	Ground Robotics	05	U	15,763	26,809		26,809
135	0605054A	Emerging Technology Initiatives	05	U	219,284	244,047		244,047

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Line No	Program Element Number	Item	Se	FY 2024
			Act	c
116	0604822A	General Fund Enterprise Business System (GFEBS)	05	U 2,965
117	0604827A	Soldier Systems - Warrior Dem/Val	05	U 11,333
118	0604852A	Suite of Survivability Enhancement Systems - EMD	05	U 79,250
119	0604854A	Artillery Systems - EMD	05	U 42,490
120	0605013A	Information Technology Development	05	U 104,024
121	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	U 102,084
122	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	U
123	0605030A	Joint Tactical Network Center (JTNC)	05	U 18,662
124	0605031A	Joint Tactical Network (JTN)	05	U 30,328
125	0605035A	Common Infrared Countermeasures (CIRCM)	05	U 11,509
126	0605036A	Combating Weapons of Mass Destruction (CWMD) Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV)	05	U 1,050
127	0605038A	Sensor Suite	05	U
128	0605041A	Defensive CYBER Tool Development	05	U 27,714
129	0605042A	Tactical Network Radio Systems (Low-Tier)	05	U 4,318
130	0605047A	Contract Writing System	05	U 16,355
131	0605049A	Missile Warning System Modernization (MWSM)	05	U 27,571
132	0605051A	Aircraft Survivability Development	05	U 24,900
133	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	U 196,248
134	0605053A	Ground Robotics	05	U 35,319
135	0605054A	Emerging Technology Initiatives	05	U 201,274

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Line No	Program Element Number	Item	Se c	FY 2022		FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment
				Act	Actuals			
136	0605143A	Biometrics Enabling Capability (BEC)	U	05	4,326	11,091		11,091
137	0605144A	Next Generation Load Device - Medium	U	05	14,835	22,439		22,439
138	0605145A	Medical Products and Support Systems Development	U	05	927			
139	0605148A	Tactical Intel Targeting Access Node (TITAN) EMD	U	05	54,972	108,987		108,987
140	0605203A	Army System Development & Demonstration	U	05	122,175	143,616		143,616
141	0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	U	05	2,192	6,530		6,530
142	0605206A	CI and HUMINT Equipment Program-Army (CIHEP-A) Joint Targeting Integrated Command and Coordination Suite (JTIC2S)	U	05				
143	0605216A		U	05				
144	0605224A	Multi-Domain Intelligence	U	05	9,313	6,008		6,008
145	0605225A	SIO Capability Development	U	05	22,713			
146	0605231A	Precision Strike Missile (PrSM)	U	05	181,574	259,506		259,506
147	0605232A	Hypersonics EMD	U	05	107,404	633,499		633,499
148	0605233A	Accessions Information Environment (AIE)	U	05	16,177	10,088		10,088
149	0605235A	Strategic Mid-Range Capability	U	05		5,016		5,016
150	0605236A	Integrated Tactical Communications	U	05		12,447		12,447
151	0605450A	Joint Air-to-Ground Missile (JAGM)	U	05	2,467	2,366		2,366
152	0605457A	Army Integrated Air and Missile Defense (AIAMD) Counter - Small Unmanned Aircraft Systems Sys Dev &	U	05	154,257	263,545		263,545
153	0605531A	Demonstration	U	05	49,667	14,892		14,892
154	0605625A	Manned Ground Vehicle	U	05	194,936	554,925		554,925
155	0605766A	National Capabilities Integration (MIP)	U	05	13,454	17,030		17,030

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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136	0605143A	Biometrics Enabling Capability (BEC)	05	U	
137	0605144A	Next Generation Load Device - Medium	05	U	36,970
138	0605145A	Medical Products and Support Systems Development	05	U	
139	0605148A	Tactical Intel Targeting Access Node (TITAN) EMD	05	U	132,136
140	0605203A	Army System Development & Demonstration	05	U	81,657
141	0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	05	U	31,284
142	0605206A	CI and HUMINT Equipment Program-Army (CIHEP-A) Joint Targeting Integrated Command and Coordination Suite (JTIC2S)	05	U	2,170
143	0605216A		05	U	9,290
144	0605224A	Multi-Domain Intelligence	05	U	41,003
145	0605225A	SIO Capability Development	05	U	
146	0605231A	Precision Strike Missile (PrSM)	05	U	272,786
147	0605232A	Hypersonics EMD	05	U	900,920
148	0605233A	Accessions Information Environment (AIE)	05	U	27,361
149	0605235A	Strategic Mid-Range Capability	05	U	348,855
150	0605236A	Integrated Tactical Communications	05	U	22,901
151	0605450A	Joint Air-to-Ground Missile (JAGM)	05	U	3,014
152	0605457A	Army Integrated Air and Missile Defense (AIAMD) Counter - Small Unmanned Aircraft Systems Sys Dev &	05	U	284,095
153	0605531A	Demonstration	05	U	36,016
154	0605625A	Manned Ground Vehicle	05	U	996,653
155	0605766A	National Capabilities Integration (MIP)	05	U	15,129

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						Enactment	Supplements Enactment*	
156	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	U	2,470	9,376		9,376
157	0605830A	Aviation Ground Support Equipment	05	U	1,158	2,959		2,959
158	0303032A	TROJAN - RH12	05	U	3,362	3,761		3,761
159	0304270A	Electronic Warfare Development	05	U	75,520	99,938		99,938
System Development & Demonstration					3,178,005	4,317,752	600	4,318,352
160	0604256A	Threat Simulator Development	06	U	60,749	138,937		138,937
161	0604258A	Target Systems Development	06	U	41,769	64,132		64,132
162	0604759A	Major T&E Investment	06	U	91,130	142,031		142,031
163	0605103A	Rand Arroyo Center	06	U	31,087	33,631		33,631
164	0605301A	Army Kwajalein Atoll	06	U	242,279	309,005		309,005
165	0605326A	Concepts Experimentation Program	06	U	80,386	86,824		86,824
166	0605502A	Small Business Innovative Research	06	U	374,118			
167	0605601A	Army Test Ranges and Facilities	06	U	362,223	417,567		417,567
168	0605602A	Army Technical Test Instrumentation and Targets	06	U	57,584	67,962		67,962
169	0605604A	Survivability/Lethality Analysis	06	U	35,042	36,500		36,500
170	0605606A	Aircraft Certification	06	U	2,398	4,777		4,777
171	0605702A	Meteorological Support to RDT&E Activities	06	U	6,389	6,958		6,958
172	0605706A	Materiel Systems Analysis	06	U	20,771	22,004		22,004
173	0605709A	Exploitation of Foreign Items	06	U	13,631	6,186		6,186
174	0605712A	Support of Operational Testing	06	U	54,797	70,718		70,718

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Total Obligational Authority
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Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No	Program Element Number	Item	Act	Se c	FY 2024 Request
156	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	U	27,243
157	0605830A	Aviation Ground Support Equipment	05	U	1,167
158	0303032A	TROJAN - RH12	05	U	3,879
159	0304270A	Electronic Warfare Development	05	U	<u>137,186</u>
System Development & Demonstration					5,639,364
160	0604256A	Threat Simulator Development	06	U	38,492
161	0604258A	Target Systems Development	06	U	11,873
162	0604759A	Major T&E Investment	06	U	76,167
163	0605103A	Rand Arroyo Center	06	U	37,078
164	0605301A	Army Kwajalein Atoll	06	U	314,872
165	0605326A	Concepts Experimentation Program	06	U	95,551
166	0605502A	Small Business Innovative Research	06	U	
167	0605601A	Army Test Ranges and Facilities	06	U	439,118
168	0605602A	Army Technical Test Instrumentation and Targets	06	U	42,220
169	0605604A	Survivability/Lethality Analysis	06	U	37,518
170	0605606A	Aircraft Certification	06	U	2,718
171	0605702A	Meteorological Support to RDT&E Activities	06	U	
172	0605706A	Materiel Systems Analysis	06	U	26,902
173	0605709A	Exploitation of Foreign Items	06	U	7,805
174	0605712A	Support of Operational Testing	06	U	75,133

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Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No	Program Element Number	Item	Se c	FY 2023 Less Supplements		FY 2023	
				Act	FY 2022 Actuals	Enactment	Supplements Enactment*
175	0605716A	Army Evaluation Center	U	06	65,693	67,058	67,058
176	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	U	06	2,537	6,097	6,097
177	0605801A	Programwide Activities	U	06	90,443	89,793	89,793
178	0605803A	Technical Information Activities	U	06	31,174	37,652	37,652
179	0605805A	Munitions Standardization, Effectiveness and Safety	U	06	54,922	60,645	60,645
180	0605857A	Environmental Quality Technology Mgmt Support	U	06	1,724	1,912	1,912
181	0605898A	Army Direct Report Headquarters - R&D - MHA	U	06	48,798	53,271	53,271
182	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	U	06	78,187	89,602	89,602
183	0606003A	CounterIntel and Human Intel Modernization	U	06	10,641	1,424	1,424
184	0606105A	Medical Program-Wide Activities	U	06	37,616		
185	0606942A	Assessments and Evaluations Cyber Vulnerabilities	U	06	5,466	5,816	5,816
186	0909999A	Financing for Cancelled Account Adjustments	U	06	101		
Management Support					1,901,655	1,820,502	1,820,502
187	0603778A	MLRS Product Improvement Program	U	07	11,865	18,463	18,463
188	0605024A	Anti-Tamper Technology Support	U	07	8,544	9,284	9,284
189	0607131A	Weapons and Munitions Product Improvement Programs	U	07	39,994	54,674	2,500
190	0607136A	Blackhawk Product Improvement Program	U	07	14,599		
191	0607137A	Chinook Product Improvement Program	U	07	65,960	67,513	67,513
192	0607139A	Improved Turbine Engine Program	U	07	250,533	228,036	228,036
193	0607142A	Aviation Rocket System Product Improvement and Development	U	07	8,831	11,312	11,312

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No	Program Element Number	Item	Act	Se c	FY 2024 Request
175	0605716A	Army Evaluation Center	06	U	71,118
176	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	U	11,204
177	0605801A	Programwide Activities	06	U	93,895
178	0605803A	Technical Information Activities	06	U	31,327
179	0605805A	Munitions Standardization, Effectiveness and Safety	06	U	50,409
180	0605857A	Environmental Quality Technology Mgmt Support	06	U	1,629
181	0605898A	Army Direct Report Headquarters - R&D - MHA	06	U	55,843
182	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	U	91,340
183	0606003A	CounterIntel and Human Intel Modernization	06	U	6,348
184	0606105A	Medical Program-Wide Activities	06	U	
185	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	U	6,025
186	0909999A	Financing for Cancelled Account Adjustments	06	U	
Management Support					1,624,585
187	0603778A	MLRS Product Improvement Program	07	U	14,465
188	0605024A	Anti-Tamper Technology Support	07	U	7,472
189	0607131A	Weapons and Munitions Product Improvement Programs	07	U	8,425
190	0607136A	Blackhawk Product Improvement Program	07	U	1,507
191	0607137A	Chinook Product Improvement Program	07	U	9,265
192	0607139A	Improved Turbine Engine Program	07	U	201,247
193	0607142A	Aviation Rocket System Product Improvement and Development	07	U	3,014

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Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No	Program Element Number	Item	Se c	FY 2022		FY 2023 Less Supplementals Enactment	FY 2023	
				Act	Actuals		Supplementals Enactment*	FY 2023 Total Enactment
194	0607143A	Unmanned Aircraft System Universal Products	U	07	4,426	10,512		10,512
195	0607145A	Apache Future Development	U	07	9,700	25,074		25,074
196	0607148A	AN/TPQ-53 Counterfire Target Acquisition Radar System	U	07	46,009	61,559		61,559
197	0607150A	Intel Cyber Development	U	07	3,611	13,343		13,343
198	0607312A	Army Operational Systems Development	U	07	28,029	26,131		26,131
199	0607313A	Electronic Warfare Development	U	07	5,673	6,432		6,432
200	0607315A	Enduring Turbine Engines and Power Systems	U	07				
201	0607665A	Family of Biometrics	U	07	1,101	1,114		1,114
202	0607865A	Patriot Product Improvement	U	07	125,851	152,312		152,312
203	0203728A	Joint Automated Deep Operation Coordination System (JADOCs)	U	07	24,556	19,311		19,311
204	0203735A	Combat Vehicle Improvement Programs	U	07	272,438	194,229		194,229
205	0203743A	155mm Self-Propelled Howitzer Improvements	U	07	168,683	116,510		116,510
206	0203744A	Aircraft Modifications/Product Improvement Programs	U	07	10,000			
207	0203752A	Aircraft Engine Component Improvement Program	U	07	127	148		148
208	0203758A	Digitization	U	07	3,759			
209	0203801A	Missile/Air Defense Product Improvement Program	U	07	122	3,109		3,109
210	0203802A	Other Missile Product Improvement Programs	U	07	9,956	9,027		9,027
211	0205412A	Environmental Quality Technology - Operational System Dev	U	07	253	793		793
212	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	U	07	58,516	20,180		20,180
213	0208053A	Joint Tactical Ground System	U	07	11,379	8,813		8,813

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Mar 2023

Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No.	Program Element Number	Item	Act	Se c	FY 2024 Request
194	0607143A	Unmanned Aircraft System Universal Products	07	U	25,393
195	0607145A	Apache Future Development	07	U	10,547
196	0607148A	AN/TPQ-53 Counterfire Target Acquisition Radar System	07	U	54,167
197	0607150A	Intel Cyber Development	07	U	4,345
198	0607312A	Army Operational Systems Development	07	U	19,000
199	0607313A	Electronic Warfare Development	07	U	6,389
200	0607315A	Enduring Turbine Engines and Power Systems	07	U	2,411
201	0607665A	Family of Biometrics	07	U	797
202	0607865A	Patriot Product Improvement	07	U	177,197
203	0203728A	Joint Automated Deep Operation Coordination System (JADOCs)	07	U	42,177
204	0203735A	Combat Vehicle Improvement Programs	07	U	146,635
205	0203743A	155mm Self-Propelled Howitzer Improvements	07	U	122,902
206	0203744A	Aircraft Modifications/Product Improvement Programs	07	U	
207	0203752A	Aircraft Engine Component Improvement Program	07	U	146
208	0203758A	Digitization	07	U	1,515
209	0203801A	Missile/Air Defense Product Improvement Program	07	U	4,520
210	0203802A	Other Missile Product Improvement Programs	07	U	10,044
211	0205412A	Environmental Quality Technology - Operational System Dev	07	U	281
212	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	U	75,952
213	0208053A	Joint Tactical Ground System	07	U	203

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Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No.	Program Element Number	Item	Act	Se c	FY 2022	FY 2023 Less Supplementals	FY 2023	FY 2023 Total Enactment
					Actuals	Enactment	Supplementals Enactment*	
216	0303028A	Security and Intelligence Activities	07	U	24,506			
217	0303140A	Information Systems Security Program	07	U	15,680	17,209		17,209
218	0303141A	Global Combat Support System	07	U	43,643	22,600		22,600
219	0303142A	SATCOM Ground Environment (SPACE)	07	U	16,186	18,297		18,297
222	0305179A	Integrated Broadcast Service (IBS)	07	U	5,430	9,926		9,926
223	0305204A	Tactical Unmanned Aerial Vehicles	07	U	8,410	4,500		4,500
224	0305206A	Airborne Reconnaissance Systems	07	U	11,782	17,165		17,165
225	0305219A	MQ-1C Gray Eagle UAS	07	U				
226	0307665A	Biometrics Enabled Intelligence	07	U	2,066			
227	0708045A	End Item Industrial Preparedness Activities	07	U	101,466	132,270		132,270
999	999999999	Classified Programs	07	U	2,993	6,664		6,664
		Operational Systems Development			1,416,677	1,286,510	2,500	1,289,010
228	0608041A	Defensive CYBER - Software Prototype Development	08	U	108,041	94,831		94,831
		Software And Digital Technology Pilot Programs			108,041	94,831		94,831
Total Research, Development, Test and Evaluation, Army					14,660,654	17,142,121	9,100	17,151,221

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Appropriation: 2040A Research, Development, Test and Evaluation, Army

Line No.	Program Element Number	Item	Se	FY 2024	
			Act	c	Request
216	0303028A	Security and Intelligence Activities	07	U	301
217	0303140A	Information Systems Security Program	07	U	15,323
218	0303141A	Global Combat Support System	07	U	13,082
219	0303142A	SATCOM Ground Environment (SPACE)	07	U	26,838
222	0305179A	Integrated Broadcast Service (IBS)	07	U	9,456
223	0305204A	Tactical Unmanned Aerial Vehicles	07	U	
224	0305206A	Airborne Reconnaissance Systems	07	U	
225	0305219A	MQ-1C Gray Eagle UAS	07	U	6,629
226	0307665A	Biometrics Enabled Intelligence	07	U	
227	0708045A	End Item Industrial Preparedness Activities	07	U	75,317
999	999999999	Classified Programs	07	U	8,786
Operational Systems Development					1,105,748
228	0608041A	Defensive CYBER - Software Prototype Development	08	U	83,570
Software And Digital Technology Pilot Programs					83,570
Total Research, Development, Test and Evaluation, Army					15,775,381

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Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 2040: Research, Development, Test & Evaluation, Army

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50	04	0603305A	Army Missile Defense Systems Integration.....	Volume 2a - 1
51	04	0603308A	Army Space Systems Integration.....	Volume 2a - 14
52	04	0603327A	Air and Missile Defense Systems Engineering.....	Volume 2a - 25
53	04	0603619A	Landmine Warfare and Barrier - Adv Dev.....	Volume 2a - 32
54	04	0603639A	Tank and Medium Caliber Ammunition.....	Volume 2a - 63
55	04	0603645A	Armored System Modernization - Adv Dev.....	Volume 2a - 99
56	04	0603747A	Soldier Support and Survivability.....	Volume 2a - 117
57	04	0603766A	Tactical Electronic Surveillance System - Adv Dev.....	Volume 2a - 124
58	04	0603774A	Night Vision Systems Advanced Development.....	Volume 2a - 149
59	04	0603779A	Environmental Quality Technology - Dem/Val.....	Volume 2a - 169
60	04	0603790A	NATO Research and Development.....	Volume 2a - 192
61	04	0603801A	Aviation - Adv Dev.....	Volume 2a - 203
62	04	0603804A	Logistics and Engineer Equipment - Adv Dev.....	Volume 2a - 235
63	04	0603807A	Medical Systems - Adv Dev.....	Volume 2a - 258
64	04	0603827A	Soldier Systems - Advanced Development.....	Volume 2a - 277
65	04	0604017A	Robotics Development.....	Volume 2a - 317

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66	04	0604019A	Expanded Mission Area Missile (EMAM).....	Volume 2a - 338
67	04	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping.....	Volume 2a - 352
68	04	0604035A	Low Earth Orbit (LEO) Satellite Capability.....	Volume 2a - 365

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Air and Missile Defense Systems Engineering	0603327A	52	04.....	Volume 2a - 25
Armored System Modernization - Adv Dev	0603645A	55	04.....	Volume 2a - 99
Army Missle Defense Systems Integration	0603305A	50	04.....	Volume 2a - 1
Army Space Systems Integration	0603308A	51	04.....	Volume 2a - 14
Aviation - Adv Dev	0603801A	61	04.....	Volume 2a - 203
Cross Functional Team (CFT) Advanced Development & Prototyping	0604020A	67	04.....	Volume 2a - 352
Environmental Quality Technology - Dem/Val	0603779A	59	04.....	Volume 2a - 169
Expanded Mission Area Missile (EMAM)	0604019A	66	04.....	Volume 2a - 338
Landmine Warfare and Barrier - Adv Dev	0603619A	53	04.....	Volume 2a - 32
Logistics and Engineer Equipment - Adv Dev	0603804A	62	04.....	Volume 2a - 235
Low Earth Orbit (LEO) Satellite Capability	0604035A	68	04.....	Volume 2a - 365
Medical Systems - Adv Dev	0603807A	63	04.....	Volume 2a - 258
NATO Research and Development	0603790A	60	04.....	Volume 2a - 192
Night Vision Systems Advanced Development	0603774A	58	04.....	Volume 2a - 149
Robotics Development	0604017A	65	04.....	Volume 2a - 317
Soldier Support and Survivability	0603747A	56	04.....	Volume 2a - 117
Soldier Systems - Advanced Development	0603827A	64	04.....	Volume 2a - 277

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Tactical Electronic Surveillance System - Adv Dev	0603766A	57	04.....	Volume 2a - 124
Tank and Medium Caliber Ammunition	0603639A	54	04.....	Volume 2a - 63

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)									
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603305A / Army Missile Defense Systems Integration									
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost		
Total Program Element	-	56.579	118.001	12.904	-	12.904	13.010	13.023	13.162	13.305	0.000	239.984		
TR5: Missile Defense Battlelab	-	56.579	118.001	12.904	-	12.904	13.010	13.023	13.162	13.305	0.000	239.984		
A. Mission Description and Budget Item Justification														
This Program Element (PE) funds missile defense systems integration efforts for the US Army Space and Missile Defense Command in its role as the Army Service Component Command (ASCC) to USSTRATCOM and USSPACECOM.														
USASMDC: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMDC as the Army proponent for ground-based midcourse defense (GMD), the Army integrator for global missile defense, and the ASCC of the U.S. Strategic Command (USSTRATCOM). Upon its establishment, USASMDC became the ASCC of the United States Space Command (USSPACECOM). Army Regulation (AR) 10-87 Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007 and AR 5-22 The Army Force Modernization Proponent System dated 19 August 2009 designates USASMDC as the Army specified proponent for Global Missile Defense (GMD) capabilities. As the Army proponent for GMD, USASMDC is responsible for developing warfighting concepts, conducting warfighting experiments to validate those concepts, identifying capabilities needed to implement the validated concepts, and developing Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to realize GMD capabilities. As the Army integrator for global missile defense, USASMDC is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM and USSPACECOM to execute their global missile defense responsibilities.														
B. Program Change Summary (\$ in Millions)					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total					
Previous President's Budget					56.702	12.001	12.708	-	12.708					
Current President's Budget					56.579	118.001	12.904	-	12.904					
Total Adjustments					-0.123	106.000	0.196	-	0.196					
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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)		
2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603305A / <i>Army Missile Defense Systems Integration</i>		
Congressional Add Details (\$ in Millions, and Includes General Reductions)			
Congressional Add: <i>Program increase - integrated environmental control and power</i>			FY 2022
Congressional Add: <i>A2IFS (Advanced Dynamic and Features Simulation)</i>			5.000
Congressional Add: <i>System Engineering Research into System Integration Air and Missile</i>			23.500
Congressional Add: <i>Mobile Solid State High Power Microwave</i>			-
Congressional Add: <i>Pragmatic Artificial Intelligence and New Technology</i>			-
Congressional Add: <i>Gun Launched Interceptors (GLI)</i>			-
Congressional Add: <i>Sensing, Modeling, Analysis, Requirements, and Training (SMART)</i>			-
Congressional Add: <i>Weather Impacts Tool Kit (WITK)</i>			-
Congressional Add: <i>AI/ML for Integrated Fires (AIF)</i>			-
Congressional Add Subtotals for Project: TR5			28.500
Congressional Add Totals for all Projects			28.500
			106.000
			106.000
Change Summary Explanation			
Increased funding due to revised economic assumptions.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603305A / Army Missile Defense Systems Integration				TR5 / Missile Defense Battlelab				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
TR5: <i>Missile Defense Battlelab</i>	-	56.579	118.001	12.904	-	12.904	13.010	13.023	13.162	13.305	0.000	239.984	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification		
This Program Element (PE) funds the Strategic Missile Defense (SMD) Force Development activities of the United States Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE). The SMDCoE is the warfighting function lead and Department of the Army force modernization proponent to develop the associated operational prototyping, experimentation, operational analysis, and modeling and simulation in support of missile defense capabilities for current and future Forces. The SMDCoE SMD Force Development workforce supports the research and doctrine development from one of the SMDCoE principle locations in Huntsville, AL; Colorado Springs, CO; and Joint Base Langley-Eustis. As the Army proponent for SMD, USASMDC is responsible for developing warfighting concepts, conducting warfighting experiments to validate those concepts, identifying capabilities needed to implement the validated concepts, and developing Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to develop future SMD capabilities. As the Army integrator for SMD, USASMDC is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM and USSPACECOM to execute their SMD responsibilities.		

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
Title: Strategic Missile Defense Experiments, Wargames and Prototypes	1.713	1.740	1.876		
Description: Develop and assess current SMD technologies and assess capabilities through participation in wargames and experiments.					
FY 2023 Plans: USASMDC SMDCoE develops and tests concepts to improve pre-launch awareness of mobile launched hypersonic weapons, to modernize the ability to track hypersonic weapons, and develop a more integrated and coordinated global missile defense command and control network.					
FY 2024 Plans: USASMDC SMDCoE will continue to pursue Army modernization priorities through participation in the Joint Warfighting Concept and support to combatant command wargaming, experimentation and concept development.					
FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.					
Title: Strategic Missile Defense Models and Simulations Infrastructure	0.750	0.761	0.875		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
<p>Description: USASMDC is the proponent for multiple models and simulations (M&S) critical to the Army and Joint analysis, exercise, wargaming, and experimentation communities.</p> <p>FY 2023 Plans: Conduct and improve Missile Defense analysis, advanced modelling and simulations by leveraging lessons learned from previous efforts. Evaluate new technologies in realistic operating environments to accurately reflect modern missile defense capabilities. Provide program management for maintenance, sustainment, and development for Extended Air Defense Simulation (EADSIM), the Joint Embedded Messaging System (JEMS), and the Reconfigurable Tactical Operations Simulator (RTOS) Suite. Develop the Future Force Experimentation Air Defense System (FFEADS) simulation model to provide operator-in-the-loop representations of all Army air and missile defense weapon, and command and control systems.</p> <p>FY 2024 Plans: Continue improve Missile Defense analysis, advanced modelling and simulations by leveraging lessons learned from previous efforts. Evaluate new technologies in realistic operating environments to accurately reflect modern missile defense capabilities. Develop the Future Force Experimentation Air Defense System (FFEADS) simulation model to provide operator-in-the-loop representations of all Army air and missile defense weapon, and command and control systems.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.</p>					
<p>Title: Disruptive Concepts and Technologies Development</p> <p>Description: Provide concept development / DOTMLPF-P support to the Army Air and Missile Defense Cross Functional Team (AMD CFT) for priority programs.</p> <p>FY 2023 Plans: USASMDC SMDCoE maintains focus on developing concepts to integrate emerging technologies which support the development of next generation capabilities to match, then outpace the threat in order to ensure success in competition, crisis, conflict, and change.</p> <p>FY 2024 Plans: Mature operating concepts leveraging advanced technologies to include Artificial Intelligence Air and Missile Defense (AIAMD), enduring Indirect Fires Protection Capability (IFPC) and laser technology air and missile defense protection systems. Develop concepts to integrate emerging technologies supporting the development of next generation capabilities to match, then outpace the threat in order to ensure success in competition, crisis, conflict, and change.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	7.296	7.531	8.156		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
2040 / 4	PE 0603305A / Army Missile Defense Systems Integration	TR5 / Missile Defense Battlelab		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Funding change reflects planned life cycle of this effort.				
Title: Strategic Missile Defense Operations Resourcing and Support		1.820	1.848	1.997
Description: Requirement supports the SMDCoE responsibility to provide resources to support underlying operating expenses for the strategic missile defense force development mission area.				
FY 2023 Plans: Continue to provide operational and logistical support to ensure the long range planning and overall mission accomplishment of the Army SMDCoE.				
FY 2024 Plans: Resources provide the support staff for senior SMDCoE leadership, budget and program support, reimbursement for Army Contracting Command (ACC), and a variety of logistical support requirements all necessary to sustain operations and ensure efficient accomplishment of the larger force development mission.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.				
Title: Electro-Magnetic Denial and Protect	6.000	-	-	-
Title: Multiple Engagement End-To-End Testbed	2.500	-	-	-
Title: PNT Resiliency Lab	8.000	-	-	-
Title: SBIR/STTR Transfer	-	0.121	-	-
Description: Funding transferred in accordance with Title 15 USC §638				
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638.				
Accomplishments/Planned Programs Subtotals		28.079	12.001	12.904
	FY 2022	FY 2023		
Congressional Add: Program increase - integrated environmental control and power	5.000	16.000		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 4	PE 0603305A / Army Missile Defense Systems Integration	TR5 / Missile Defense Battlelab	
		FY 2022	FY 2023
FY 2022 Accomplishments: The project addressed the need and requirement as set forth by CENTCOM and expressed to the Rapid Equipping Force to facilitate integration of power generation equipment with environmental control systems for lighter weight and true plug-and-play operation. The effort built an advanced high efficiency AC and DC compatible ECU and electronics cooling technologies using technologies developed under this program in the past years and thus allowed for the rapid integration of highly compact and energy efficient DC generators. These integrated systems found their best use in battlefield theaters for air missile defense applications.			
FY 2023 Plans: Develop cooling tech for the Force to facilitate integration of power generation equipment with environmental control systems.			
Develop advanced high efficiency AC and DC compatible electronics cooling technologies for the rapid integration of highly compact and energy efficient DC generators.			
Integrate thermal and power management subsystems to refine and mature platforms for directed energy weapon (DEW) in pods or small stationary container systems to more effectively operate and contribute to Integrated Air and Missile Defense objectives.			
Congressional Add: A2IFS (Advanced Dynamic and Features Simulation)		23.500	20.000
FY 2022 Accomplishments: Develop advanced ground test techniques and technologies to dramatically decrease the cost and schedule associated with the development of ground testing and hypersonic systems development by: Providing continuous test capability to accelerate the deployment of advanced systems Providing precise control of testing environment provides highest fidelity data capture Providing a secure method to develop future systems without adversary observation			
FY 2023 Plans: Develop advanced ground test techniques and technologies to dramatically decrease the cost and schedule associated with the development of ground testing and hypersonic systems development by: Providing continuous test capability to accelerate the deployment of advanced systems Providing precise control of testing environment provides highest fidelity data capture Providing a secure method to develop future systems without adversary observation.			
Congressional Add: System Engineering Research into System Integration Air and Missile		-	10.000
FY 2023 Plans: Conduct an Advanced System Engineering Research into System Integration Air and Missile (SERSAM) for complete kill chain of air and missile defense technology evaluation capability.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab	
		FY 2022	FY 2023
SERSAM will be designed and developed to include offensive and defensive weapon technologies to engage threats in a realistic system of systems environment. Work will include technology trade studies of advanced technologies and defense systems. Simulated engagement plans would be utilized to drive the testbed simulations (e.g. 3DOF, 6DOF) with High Frequency.			
Congressional Add: Mobile Solid State High Power Microwave FY 2023 Plans: Develop High Power Microwave (HPM) technologies and systems capable of engaging specific target classes. Develop and Demonstrate Scalable HPM Devices that can be integrated on multiple platforms. Assess HPM lethality to optimized effects in threat systems. Identify HPM protection capabilities to battlefield systems.		-	25.000
Congressional Add: Pragmatic Artificial Intelligence and New Technology FY 2023 Plans: Establish the Laboratory to apply Artificial Intelligence (AI) "Expert Systems" to near-term, engineering solutions. Machine Learning based Computer Vision with application to both Automatic Target Recognition (ATR) and image-based map generation. Test asset deployment planning optimization using AI expert systems. Planning and optimization using AI expert systems for the Integrated Defense Planner Lab AI enabled weapons pairing to optimize weapon to threat assignments in a complex environments.		-	15.000
Congressional Add: Gun Launched Interceptors (GLI) FY 2023 Plans: Counter - Rocket, Artillery, Mortar / Unmanned Aerial Systems (C-RAM / C-UAS) defenses can be overwhelmed by swarm attack. Prototype a maneuverable, laser guided GLI by utilizing an Insensitive Munitions compliant solid propulsion divert system and a laser seeker assembly. Design, integrate, and test a prototype GLI to address the C-RAM / C-UAS mission as part of the Integrated Air and Missile Defense role.		-	3.000
Congressional Add: Sensing, Modeling, Analysis, Requirements, and Training (SMART)		-	10.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 4	PE 0603305A / Army Missile Defense Systems Integration	TR5 / Missile Defense Battlelab	
		FY 2022	FY 2023
FY 2023 Plans: Rapid Mission planning and Range Safety capabilities leveraging existing, proven and low-risk systems.			
Complete, accredit, and deploy the Flight Analysis Software Toolkit for weapons flight mission planning and flight testing. Includes requirement to expedite evaluation of pre-test predictions with observed performance in long range weapon test event.			
Develop deployable ground-based (land/sea) unmanned sensors that measure weapon system accuracy, lethality, and potential for collateral effects.			
Congressional Add: Weather Impacts Tool Kit (WITK)		-	5.000
FY 2023 Plans: Rapid Mission planning and Range Safety capabilities leveraging existing, proven and low-risk systems.			
Complete, accredit, and deploy the Flight Analysis Software Toolkit for weapons flight mission planning and flight testing. Includes requirement to expedite evaluation of pre-test predictions with observed performance in long range weapon test event.			
Develop deployable ground-based (land/sea) unmanned sensors that measure weapon system accuracy, lethality, and potential for collateral effects.			
Congressional Add: AI/ML for Integrated Fires (AIF)		-	2.000
FY 2023 Plans: Develop and Artificial Intelligence/Machine Learning (AI/ML) engineering software for command and control for integrated fires capability.			
Apply AI software that captures expert knowledge into a autonomous capability			
Develop methodologies, decision making criteria matching expert knowledge for Command and Control applications for integrated fires in complex environments.			
Congressional Adds Subtotals		28.500	106.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab
C. Other Program Funding Summary (\$ in Millions)		
Remarks SMDCoE strategic missile defense capability development efforts have a natural association and linkage with Army Space and High Altitude (SHA) capability development also performed within the SMDCoE. Emerging space and high altitude technologies and concepts often influence SMD identification, tracking and response.		
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration				Project (Number/Name) TR5 / Missile Defense Battlelab							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Personnel and Operations Support	C/TBD	To Be determined : To be Determined	23.207	7.797		8.356		8.934		-		8.934	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.121	Feb 2023	-	-	-	-	0.000	0.121	-	
	Subtotal		23.207	7.797		8.477		8.934		-		8.934	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contracts	Various	To Be Determined : To Be determined	9.698	3.782		3.524		3.970		-		3.970	Continuing	Continuing	-
Electro-Magnetic Denial and Protect (CA)	TBD	SMDC : Various	-	6.000		-		-		-		-	0.000	6.000	-
Integrated Environmental Control and Power (CA)	TBD	SMDC : Various	-	5.000		16.000		-		-		-	0.000	21.000	-
Multiple Engagement End-To-End Testbed	TBD	SMDC : Various	-	2.500		-		-		-		-	0.000	2.500	-
A2IFS (Advanced Dynamic and Instrumentation and Features Simulation) (CA)	TBD	SMDC : Various	-	23.500		20.000		-		-		-	0.000	43.500	-
PNT Resiliency Lab (CA)	TBD	SMDC : Various	-	8.000		-		-		-		-	0.000	8.000	-
System Engineering Research into System Integration Air and Missile (CA)	TBD	SMDC : Various	-	-		10.000		-		-		-	0.000	10.000	-
Mobile Solid State High Power Microwave (CA)	TBD	SMDC : Various	-	-		25.000		-		-		-	0.000	25.000	-
Pragmatic Artificial Intelligence and New Technology (CA)	TBD	SMDC : Various	-	-		15.000		-		-		-	0.000	15.000	-
Gun Launched Interceptors (CA)	TBD	SMDC : Various	-	-		3.000		-		-		-	0.000	3.000	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration				Project (Number/Name) TR5 / Missile Defense Battlelab							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Sensing, Modeling, Analysis, Requirements, and Training (SMART) (CA)	TBD	SMDC : Various	-	-		10.000		-		-		-	0.000	10.000	-
Weather Impacts Tool Kit (WITK) (CA)	TBD	SMDC : Various	-	-		5.000		-		-		-	0.000	5.000	-
AI/ML for Integrated Fires (AIF) (CA)	TBD	SMDC : Various	-	-		2.000		-		-		-	0.000	2.000	-
Subtotal		9.698	48.782			109.524		3.970				3.970	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			32.905	56.579		118.001		12.904		-		12.904	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023						
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)												
2040 / 4				PE 0603305A / Army Missile Defense Systems Integration				TR5 / Missile Defense Battlelab												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		FY 2028		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Experiments & Technology Enhancements of Prototypes	Eval integration of tech identified in Wargame Campaign Plan and Analysis 12-14																			
Development of Extended Air Defense Simulation Updates																				
Reconfigurable Tactical Operations System (RTOS) Development																				
Force Development Support to the Air and Missile Defense...																				
AN/TPY-2 Forward Based Mode (FBM) Program Management																				
Missile Defense Simulation Support for the Joint Warfight...																				
Force Design Requirements Assessment for Missile Defense...																				
Hypersonics Tracking Capability Development																				
Provide Support to Army Future Command's Modernization E...																				
Future Force Experimentation Air Defense System (FFEADS)...	1			2			3			4										
Analysis Support to Joint Inter Agency Missile Defense O...	1			2			3			4										

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Experiments & Technology Enhancements of Prototypes	1	2022	4	2027
Development of Extended Air Defense Simulation Updates	1	2022	4	2027
Reconfigurable Tactical Operations System (RTOS) Development	1	2022	4	2027
Force Development Support to the Air and Missile Defense Cross Functional Team	1	2022	4	2027
AN/TPY-2 Forward Based Mode (FBM) Program Management	1	2022	4	2027
Missile Defense Simulation Support for the Joint Warfighting Concept	1	2022	4	2027
Force Design Requirements Assessment for Missile Defense Forces	1	2022	4	2027
Hypersonics Tracking Capability Development	1	2022	4	2027
Provide Support to Army Future Command's Modernization Enterprise Processes	1	2022	4	2027
Future Force Experimentation Air Defense System (FFEADS) Development	2	2022	3	2024
Analysis Support to Joint Inter Agency Missile Defense Office (JIAMDO)	1	2022	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603308A / Army Space Systems Integration											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
Total Program Element	-	25.401	30.945	19.120	-	19.120	19.417	19.434	19.640	19.851	0.000	153.808				
990: Space And Missile Defense Integration	-	25.401	30.945	19.120	-	19.120	19.417	19.434	19.640	19.851	0.000	153.808				
A. Mission Description and Budget Item Justification																
The Friendly Force Data Integration and Management (FFDIM) Capability Definition Package (CDP), a Joint Capabilities Integration and Development System (JCIDS) requirements document (October 2017) validated the Joint Friendly Force Tracking (JFFT) Testbed's development, testing and integration capabilities and Friendly Force Tracking (FFT) System Expert support provided by U.S. Army Space and Missile Defense Command (USASMDC) as U.S. Strategic Command's (USSTRATCOM's) Army Service Component Command (ASCC). In addition, Chairman of the Joint Chiefs of Staff Instruction 3910 (FFT Operations Guidance) directs USSTRATCOM's ASCC to execute eight specified FFT mission support responsibilities that include providing a testing and development capability to support joint, interagency and coalition partners FFT operations. USASMDC/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMDC/ARSTRAT as the Army proponent for space, the Army integrator for global missile defense (GMD), and the Army Service Component Command (ASCC) of the USSTRATCOM. Army Regulation (AR) 10-87, Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007, and AR 5-22, The Army Force Modernization Proponent System, dated 19 August 2009, designated USASMDC/ARSTRAT as the Army specified proponent for Space/High Altitude capabilities. As the Army proponent for space and high altitude, USASMDC/ARSTRAT is responsible for developing warfighting concepts, conduct warfighting experiments to validate those concepts, identify capabilities needed to implement the validated concepts, and develop Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions.																
B. Program Change Summary (\$ in Millions)					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total							
Previous President's Budget					25.755	17.945	19.087	-	-	-	-	-	19.087			
Current President's Budget					25.401	30.945	19.120	-	-	-	-	-	19.120			
Total Adjustments					-0.354	13.000	0.033	-	-	-	-	-	0.033			
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-	-	-	-	-			
Congressional Add Details (\$ in Millions, and Includes General Reductions)																
Project: 990: Space And Missile Defense Integration																
										FY 2022	FY 2023					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023	
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603308A / <i>Army Space Systems Integration</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions) Congressional Add: <i>Multi Function and Multi Mission Payload</i> Congressional Add: <i>Communications Resiliency Arrays of Distributed Local Elements (CRADLE)</i> Congressional Add: <i>Multi-mission Synthetic Aperture Radar Payload Development</i> Congressional Add: <i>Full Spectrum Protective Technologies for Cyber Mission Assurance</i>		FY 2022	FY 2023
		2.000	-
		5.000	-
		-	5.000
		-	8.000
		7.000	13.000
		Congressional Add Subtotals for Project: 990	
		Congressional Add Totals for all Projects	
		7.000	13.000
Change Summary Explanation Increased funding due to revised economic assumptions.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603308A / Army Space Systems Integration				990 / Space And Missile Defense Integration				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
990: Space And Missile Defense Integration	-	25.401	30.945	19.120	-	19.120	19.417	19.434	19.640	19.851	0.000	153.808	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the Space and High Altitude (SHA) Force Development activities of the United States Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE). The SMDCoE is the warfighting function lead and Department of the Army force modernization proponent for integration of current and future SHA systems to enable Army forces on the battlefield. The SMDCoE workforce supports the research and doctrine development from one of the SMDCoE principle locations in Huntsville, AL; Colorado Springs, CO; and Joint Base Langley-Eustis. As the Army proponent for SHA, the SMDCoE is responsible for developing warfighting concepts, identifying and validating needed capabilities, conducting warfighting experiments, and developing Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions for the Army to leverage the SHA domains in support of Army operations. The SMDCoE focuses on providing solutions for capability gaps of land domain forces in a multi-domain battle environment in two ways: First, by leveraging the benefits of the SHA domains to enable decentralized land force operations in support of the Army's mission command philosophy; and second by delivering synchronized capabilities from, through and into the space domain in direct support of land domain forces. Effective integration of SHA capabilities enable the application of strategic land power and execution of Multi-Domain Operations (MDO). Additionally, SHA capabilities anchor the Army's ability to penetrate and disintegrate enemy anti-access and area denial (A2AD) systems and exploit the resultant freedom of maneuver to achieve strategic objectives and force a return to competition on favorable terms. Under the direction of an experienced member of the Senior Executive Service (SES), the SMDCoE receives guidance from the USASMDC Commanding General and works in close coordination with the Army Combined Arms Center, Army Futures Command, the United States Strategic Command, the United States Space Command the Missile Defense Agency.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: Space and High Altitude Capability Development Proponency	9.925	9.953	10.910
Description: Perform Army Force Modernization Responsibilities for the SHA Altitude Domains.			
FY 2023 Plans: Support Army modernization efforts by developing concepts to integrate emerging technologies to enhance Multi-Domain Operation with a particular focus on increasing Multi-Domain Task Force (MDTF), Multi-Domain Effects Battalion (MDEB) and Theater Strike Effects Groups (TSEG) capabilities.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 4	PE 0603308A / Army Space Systems Integration	990 / Space And Missile Defense Integration			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
<p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.</p> <p>Title: Joint Friendly Force Tracking (J-FFT) Testbed Description: Development and deployment of J-FFT capabilities.</p> <p>FY 2023 Plans: J-FFT testbed and development teams respond to the growth in FFT device use by enabling multiple device types, data types, and displays supported by the various FFT and HF TTL data architectures. The JFFT Testbed will develop and deliver new capabilities for added functionality in data visualization and management. JFFT will continue to exploit, expand and provide approved infrastructures at all classification levels that improve performance and reduce costs.</p> <p>FY 2024 Plans: J-FFT will continue to exploit, expand and provide mission owners with approved infrastructures at all classification levels that achieve improved performance and reduce costs. Ensure J-FFT technologies remain a key contributor to support coalition assessments and exercises that advancing US and allies FFT interoperability.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.</p>			3.652	3.200	3.368
<p>Title: Assured Positioning, Navigation and Timing / Navigation Warfare (A-PNT/NAVWAR) Description: Provide PNT/NAVWAR capability development support for the Army.</p> <p>FY 2023 Plans: The SMDCoE Army Capability Manager for Space and High Altitude (ACM SHA) works to mitigate capability gaps due to the growing threat to PNT, to provide situational awareness of the NAVWAR environment, and to prevent adversary use of PNT information through coordinated employment of NAVWAR capabilities.</p> <p>FY 2024 Plans:</p>			2.567	2.355	2.263

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Continue to identify, develop, integrate and provide the Assured-Positioning, Navigation, and Timing (A-PNT) Cross Functional Team (CFT)with products and analysis to guide development and fielding of capabilities to achieve the PNT overmatch necessary to support future Army operations.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.	Title: Space and High Altitude Models, Simulations and Operations Support Description: Supports the SMDCoE responsibility to provide Space and High Altitude modeling and simulations, and resources underlying operating expenses and support.	2.257	2.125	2.579
FY 2023 Plans: Resources provide the computational and network resources, modeling and simulation, and operational analysis required to support major decisions concerning the acquisition of systems and the development of concepts of operations (CONOPS) that provide the best Joint, and Army Space and High Altitude capabilities to current and future Warfighters.				
FY 2024 Plans: Continue to support modeling and simulation, operational analysis and overarching operations to test and provide analytical rigor behind space and high altitude concepts and capability development				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned life cycle of this effort.		-	0.312	-
Title: SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC §638				
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638.				
Accomplishments/Planned Programs Subtotals		18.401	17.945	19.120
		FY 2022	FY 2023	
Congressional Add: Multi Function and Multi Mission Payload		2.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration	
		FY 2022	FY 2023
FY 2022 Accomplishments: This project will develop a low-cost multi-function multi-mission SAR sensor payload that can be used to provide SAR imagery for multiple mission functions including weather prediction, mission planning and other tactical and strategic operations. Project will result in a design of LEO satellite to provide high resolution, multi-spectral imagery of cloud cover, including sensor, orbital configuration and down linked high resolution multi-spectral capability for multiple missions.			
Congressional Add: Communications Resiliency Arrays of Distributed Local Elements (CRADLE)		5.000	-
FY 2022 Accomplishments: CRADLE is a new bi-static communications and radar system that uses Army developed technologies to form distributed arrays using networks of local elements in theater. The successful implementation will leverage not only new advancements in beam-forming but also the Army's investment in portable communication systems.			
Congressional Add: Multi-mission Synthetic Aperture Radar Payload Development		-	5.000
FY 2023 Plans: This project will develop a low-cost multi-function multi-mission SAR sensor payload that can be used to provide SAR imagery for multiple mission functions including weather prediction, mission planning and other tactical and strategic operations. Project will result in a design of LEO satellite to provide high resolution, multi-spectral imagery of cloud cover, including sensor, orbital configuration and down linked high resolution multi-spectral capability for multiple missions.			
Congressional Add: Full Spectrum Protective Technologies for Cyber Mission Assurance		-	8.000
FY 2023 Plans: Develop protective technologies and capabilities to safeguard critical assets across the space and missile defense capability areas from cyber exploitation to ensure a sustained competitive edge against near-peer adversaries.			
Congressional Adds Subtotals		7.000	13.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
SMDCoE space and high altitude capability development efforts have a natural association and linkage with Army Strategic Missile Defense (SMD) capability development also performed within the SMDCoE. Emerging space and high altitude technologies and concepts often influence SMD identification, tracking and response.			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration				Project (Number/Name) 990 / Space And Missile Defense Integration							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Personnel and Operations support	TBD	SMDC/ARSTRAT : Huntsville, AL and Colorado Springs,	17.537	18.401		14.433		15.752		-		15.752	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.312		-	-	-		0.000	0.312	-	
Subtotal		17.537	18.401			14.745		15.752		-		15.752	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Communications Resiliency Arrays of Distributed Local Elements (CRADLE) (CA)	TBD	SMDC : Various	-	5.000		-		-		-		-	0.000	5.000	-
Multi-Function and Multi-Mission Payload	TBD	Various : Various	-	2.000		-		-		-		-	0.000	2.000	-
Multi-mission Synthetic Aperture Radar Payload Development	TBD	Various : Various	-	-		5.000		-		-		-	0.000	5.000	-
Full Spectrum Protective Technologies for Cyber Mission Assurance	TBD	Various : Various	-	-		8.000		-		-		-	0.000	8.000	-
Subtotal		-	7.000			13.000		-		-		-	0.000	20.000	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
J-FFT Testbed and Development	TBD	SMDC/ARSTRAT : Colorado Springs, CO	3.170	-		3.200		3.368		-		3.368	0.000	9.738	-
Subtotal		3.170	-			3.200		3.368		-		3.368	0.000	9.738	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration			Project (Number/Name) 990 / Space And Missile Defense Integration						
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.707	25.401		30.945		19.120		-	19.120	Continuing	Continuing	N/A
Remarks												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)							Project (Number/Name)										
2040 / 4				PE 0603308A / Army Space Systems Integration							990 / Space And Missile Defense Integration										
				FY 2022				FY 2023				FY 2024				FY 2025					
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Space Superiority Capability Development																					
Counter ISR Capability Development																					
Space Operations Mult-Domain Environment Analysis																					
Multi-Domain Task Force (MTDF) Multi-Domain Expeditionary...																					
APNT CFT Analysis Support																					
Joint Space Warfighting Forum (JSWF) Analysis Support																					
Tactical Space Layer Sensor to Shooter Concept Development																					
Development of SMDC MMN Force Tracking																					
Jericho Thunder Analysis Support																					
Space Superiority Joint Architecture Analysis																					
Force Design Assessment of Army Forces																					
NAWWAR/PNT Gap Analysis and Advocacy																					
Space Simulation Support to TRADOC ARCIC Experimentation																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023													
Appropriation/Budget Activity							R-1 Program Element (Number/Name)							Project (Number/Name)													
2040 / 4							PE 0603308A / Army Space Systems Integration							990 / Space And Missile Defense Integration													
Event Name																											
FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1 2 3 4				1 2 3 4				1 2 3 4				1 2 3 4				1 2 3 4				1 2 3 4				1 2 3 4			
NAVMAR Defense/Attack Operating Concepts and Requirements																											
Army Enduring JFFT Development																											
High Altitude Persistent Platform Capability Development...																											
APNT Integrated Space Communications																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Space Superiority Capability Development	1	2021	4	2027
Counter ISR Capability Development	1	2021	4	2027
Space Operations Mult-Domain Environment Analysis	1	2021	4	2027
Multi-Domain Task Force (MTDF) Multi-Domain Expeditionary Brigade (MDEB) Study	3	2021	3	2023
High Altitude Impacts on Ground Effectiveness Study	1	2021	1	2021
NAVWAR Characterization Study	1	2021	1	2021
APNT CFT Analysis Support	1	2021	4	2027
Joint Space Warfighting Forum (JSWF) Analysis Support	1	2021	4	2027
Tactical Space Layer Sensor to Shooter Concept Development	3	2021	4	2027
Low Earth Orbit	1	2021	4	2021
Development of SMDC MMN Force Tracking	1	2021	4	2023
Jericho Thunder Analysis Support	1	2021	4	2024
SMDC NanoSat Analysis (SNAP, KE)	1	2021	4	2021
Space Superiority Joint Architecture Analysis	1	2021	4	2024
Force Design Assessment of Army Forces	1	2021	4	2027
NAVWAR/PNT Gap Analysis and Advocacy	1	2021	4	2025
Space Simulation Support to TRADOC ARCIC Experimentation	1	2021	4	2027
NAVWAR Defense/Attack Operating Concepts and Requirement	1	2021	4	2027
Army Enduring JFFT Development	1	2021	4	2027
High Altitude Persistent Platform Capability Development Documentation	1	2021	4	2027
APNT Integrated Space Communications	1	2021	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603327A / Air and Missile Defense Systems Engineering								
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	0.000	15.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing	
FG9: Air and Missile Defense (AMD) Electronic Warfare	-	15.000	15.000	-	-	-	-	-	-	-	Continuing	Continuing	

Note
There is no requested funding for Project FG9: Air and Missile Defense (AMD) Electronic Warfare in FY 2024.

A. Mission Description and Budget Item Justification
Funding in this program supports Cyber and Electromagnetic Activities (CEMA) efforts to conduct operational realistic assessments of Army Integrated Fires performance, identify system vulnerabilities, and develop mitigations against threats across the Cyber and Electromagnetic spectrum. Army radars and sensors, integrated air and missile defense mission command and fire control, Radio Frequency (RF) data and voice networks, and Positioning, Navigation, and Timing (PNT) technology will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA activities with Army Integrated Fires systems, to include other Service and other Agency radar and sensor systems as appropriate. Upon completion of CEMA demonstration analyses, funding will facilitate initial recommendations for potential mitigations and solutions to Army sensors, Command & Control (C2), and RF data link vulnerabilities. Efforts in this program will also develop tools for use by Army radar and sensor systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Additionally, virtual models of critical hardware and software are being developed and implemented to allow for destructive testing with advanced CEMA threats in a lab environment. There will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. These activities follow a time-phased roadmap that identifies the investments needed to improve the resiliency of Army radar and sensors, C2, and RF data and voice networks in contested CEMA environments.

FY 2023 funding supports Machine Learning (ML) for Integrated Fires which supports integration of ML technology into CEMA Detection algorithms. FY 2023 funding also supports the execution of prototype implementation of software memory protection methods to immunize missile programs and air and missile defense systems from cybersecurity threats.

There is no funding for FY 2024.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603327A / Air and Missile Defense Systems Engineering			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	15.000	0.000	0.000	-	0.000
Current President's Budget	15.000	15.000	0.000	-	0.000
Total Adjustments	0.000	15.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: FG9: Air and Missile Defense (AMD) Electronic Warfare					
Congressional Add: Program Increase - Machine Learning for Integrated Fires					
Congressional Add: Program Increase - Software Memory Protection Methods					
Congressional Add Subtotals for Project: FG9					
Congressional Add Totals for all Projects					
		FY 2022	FY 2023		
		10.000	10.000		
		5.000	5.000		
		15.000	15.000		
		15.000	15.000		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)					
2040 / 4					PE 0603327A / Air and Missile Defense Systems Engineering				FG9 / Air and Missile Defense (AMD) Electronic Warfare					
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost		
FG9: Air and Missile Defense (AMD) Electronic Warfare	-	15.000	15.000	-	-	-	-	-	-	-	Continuing	Continuing		
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-				

A. Mission Description and Budget Item Justification

Funding in this program supports Cyber and Electromagnetic Activities (CEMA) efforts to conduct operational realistic assessments of Army Integrated Fires performance, identify system vulnerabilities, and develop mitigations against threats across the Cyber and Electromagnetic spectrum. Army radars and sensors, integrated air and missile defense mission command and fire control, Radio Frequency (RF) data and voice networks, and Positioning, Navigation, and Timing (PNT) technology will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA activities with Army Integrated Fires systems, to include other Service and other Agency radar and sensor systems as appropriate. Upon completion of CEMA demonstration analyses, funding will facilitate initial recommendations for potential mitigations and solutions to Army sensors, Command & Control (C2), and RF data link vulnerabilities. Efforts in this program will also develop tools for use by Army radar and sensor systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Additionally, virtual models of critical hardware and software are being developed and implemented to allow for destructive testing with advanced CEMA threats in a lab environment. There will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. These activities follow a time-phased roadmap that identifies the investments needed to improve the resiliency of Army radar and sensors, C2, and RF data and voice networks in contested CEMA environments.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Program Increase - Machine Learning for Integrated Fires	10.000	10.000
FY 2022 Accomplishments: Software memory protection and machine learning.		
Supports memory protection and machine learning in contested environment.		
FY 2023 Plans: Continues software memory protection and machine learning.		
Continues support of memory protection and machine learning in contested environment.		
Congressional Add: Program Increase - Software Memory Protection Methods	5.000	5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
<p>FY 2022 Accomplishments: - Develop technology transition paths for software memory protection methods that align with on-going missile programs and air and defense missile systems - Execute prototype implementation of software memory protection methods to immunize missile programs, and air and missile defense systems, from the primary cybersecurity threat to software today, memory corruption exploits</p> <p>FY 2023 Plans: Continue development of technology transition paths for software memory protection methods that align with on-going missile programs and air and defense missile systems.</p> <p>Execute prototype implementation of software memory protection methods to immunize missile programs, and air and missile defense systems, from the primary cybersecurity threat to software today, memory corruption exploits.</p>			
Congressional Adds Subtotals		15.000	15.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy Assessment events will be conducted approximately every two years in live and simulated CEMA environments. In addition to Government planning and conduct of assessments, funding will also be provided through various contracts for subject matter expertise.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Sy stems Engineering				Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Machine Learning for Integrated Fires	Various	Various : Various	-	10.000	Jun 2022	10.000		-		-		-	0.000	20.000	-
Software Memory Protection Methods	Various	Various : Various	-	5.000	Jun 2022	5.000		-		-		-	0.000	10.000	-
Subtotal			-	15.000		15.000		-		-		-	0.000	30.000	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	15.000		15.000		-		-		-	0.000	30.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)												
2040 / 4				PE 0603327A / Air and Missile Defense Systems Engineering				FG9 / Air and Missile Defense (AMD) Electronic Warfare												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		FY 2028		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FY21 Survivability Exercise Analysis and Trade Studies	1	2																		
FY 21 Survivability Exercise Report and Implementation		1	2	3	4															
Air and Missile Defense Systems Hardware Virtualization		1	2	3	4															
FY23 Survivability Exercise Planning Efforts			1	2	3	4														

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare		
Schedule Details				
Events	Start	End	Quarter	Year
P-11 Demonstration	2	2018	3	2018
P-11 Analysis Efforts, Trade Studies, and Implementation	3	2018	1	2019
P-12 Demonstration Planning Efforts	4	2018	4	2019
P-12 Demonstration	4	2019	1	2020
P-12 Analysis Efforts, Trade Studies, and Implementation	1	2020	4	2020
FY21 Survivability Exercise Planning Efforts	4	2020	2	2021
FY21 Survivability Exercise	2	2021	3	2021
FY21 Survivability Exercise Analysis and Trade Studies	3	2021	1	2022
FY 21 Survivability Exercise Report and Implementation	2	2022	4	2022
Air and Missile Defense Systems Hardware Virtualization	2	2019	4	2022
Interoperability of Integrated Air and Missile Defense (Congressional Adds)	4	2018	2	2021
FY23 Survivability Exercise Planning Efforts	4	2022	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603619A / Landmine Warfare and Barrier - Adv Dev											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
Total Program Element	-	44.933	61.953	47.537	-	47.537	6.165	6.165	6.229	6.298	Continuing	Continuing				
BU5: Standoff Volcano Obstacle (SAVO) Adv Tech	-	2.292	-	-	-	-	-	-	-	-	0.000	2.292				
CE5: Breaching Capability Development - Mounted	-	3.726	7.157	7.131	-	7.131	-	-	-	-	0.000	18.014				
EK7: Area Denial Capability Development	-	38.915	54.796	40.406	-	40.406	6.165	6.165	6.229	6.298	Continuing	Continuing				

A. Mission Description and Budget Item Justification

Project BU5 - XM343 Standoff Activated Volcano Obstacle (SAVO) supports the United States Army Europe (USAREUR) Operational Needs Statement (ONS) #18-22702 as well as revisions to the Multiple Delivery Mine System (Volcano) Joint Service Operational Requirement (JSOR) # 0683. This capability will allow for a formation of pre-emplaced directed obstacles that can be initiated remotely via fielded wired or wireless initiation systems. XM343 SAVO can be initiated via one of three fielded systems; the M7 Spider Networked Munition System, the MK152/M156 Remote Activation Munition Systems (RAMS), or the CD450-4J Blasting Machine. SAVO can operate independently but can be used in conjunction with the Top Attack systems such as the XM204 Interim Top Attack system to create a complex obstacle. The primary item is the newly developed SAVO base plate which is placed on the ground and has four ports to connect fielded Volcano mine canisters. The base plate is packaged with ancillary components to aid in emplacement such as initiation wire, stabilizing ground stakes, sand bags, and canister carrying straps. If the emplaced obstacle is not initiated, SAVO can be recovered for future re-deployment. This item is US anti-personnel landmine policy compliant and supports the U.S. Army modernization priorities in support of Multi Domain Operations (MDO). SAVO Trainer base plates will reflect the form, fit, function, and weight of the tactical XM343 SAVO base plate. Trainer base plates interface with the fielded Volcano training canisters and are reusable. Upon receipt of a launch signal from a fielded initiation system, the training base plates produce sight and sound effects to effectively represent the SAVO obstacle's mine launch and armed status functionality.

Projects CE5 - The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles which does not support Multi-Domain Operations (MDO). This effort will focus on the development of the Next Generation Breaching Technology - Explosive Breacher system, an MDO-capable modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhanced operational reliability, supportability, mobility and survivability beyond the current state. The target platforms for Explosive Breacher are the Assault Breacher Vehicle (ABV), as well as the Remote Combat Vehicle (RCV). Explosive Breacher has been endorsed by the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT) to fulfill the RCV breaching requirements. The modularity also allows for integration with other current and future platforms. The FY 2024 request supports continued Technology Maturation and Risk Reduction (TMRR), as well as a system-level concept demonstration / soldier touchpoint and pre-milestone B activities to support an FY25 MS-B.

Project EK7 - Project EK7 Area Denial Capability Development provides for the advanced capability development of Close Terrain Shaping Obstacle (CTSO) systems and develops modernized, non-persistent U.S. Anti-personnel landmine policy compliant munition fields. During joint, multi-domain, high intensity conflict CTSO systems

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0603619A / Landmine Warfare and Barrier - Adv Dev				
<p>disrupt, fix, turn and block enemy freedom of maneuver while enhancing friendly freedom of maneuver within the same battle space. CTSO systems enable maneuver commanders to directly influence where battlefield engagements occur. CTSO systems will replace a portion of the Family of Scatterable Mines (FASCAM) systems which are beyond their designed life. The project will evaluate integrated technologies and develop prototype systems in a realistic operating environment for the next generation of CTSO systems to achieve doctrinally required obstacle effects during combat operations. CTSO systems will use an open system and modular architecture to facilitate future development, maintenance, repair, and product improvements. XM204 Interim Top Attack program, the first CTSO capability insertion, has entered into production and will achieve Initial Operational Capability (IOC) by FY 2025 to meet United States Army Europe (USAREUR) Operational Needs Statement (ONS) #18-22702. XM204 can operate independently but can be used in conjunction with the Standoff Activated Volcano Obstacle (SAVO) system to create a complex obstacle. The Army is incrementally developing an enduring solution to fill the close directed obstacle capability gap. The three increments are the Increment 1 (Top Attack), Increment 2 (Bottom Attack) and Increment 3 (Full Networked Capability) that comply with DoD Landmine Policy. Increments 1 and 2 provide the commander greater speed and flexibility to transition between offensive and defensive operations. Increment 3 Full Network Capability (FNC) will integrate the Top and Bottom Attack programs into Mission Command. The enduring CTSO capability development supports the approved Common Anti-Vehicular Munition (CAVM)-based Close Terrain Shaping Obstacle (CTSO) Abbreviated-Capability Development Document (A-CDD) and Army Futures Command (AFC) Terrain Shaping Strategy for Land Domain and Multi-Domain Operations (MDO). CAVM will be used for future mid and deep ranges in accordance with the AFC Terrain Shaping Strategy for Land Domain and MDO. CTSO systems are a networked munition capability suite composed of top and bottom attack munitions which can be employed independently or together to create a controlled, scalable complex obstacle.</p>					
<p>The total cost of the CTSO Inc. 1 Middle Tier of Acquisition effort is \$101 million RDT&E from FY23 to FY24. The CTSO Inc. 1 MTA is fully funded across the Future Years Defense Program.</p>					
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	46.637	64.001	41.260	-	41.260
Current President's Budget	44.933	61.953	47.537	-	47.537
Total Adjustments	-1.704	-2.048	6.277	-	6.277
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.704	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	6.277	-	6.277
• FFRDC Transfer	-	-0.048	-	-	-
• Ukraine Supplemental	-	6.000	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
Change Summary Explanation <p>The programs changed in the amount of +\$6.277M is caused by a decrease to Area Denial Capability Development in the amount of -\$0.854M and an increase to Breaching Capability Development-Mounted in the amount of +\$7.131M. The addition of +\$7.131M on Breaching Capability Development - Mounted, is required for continued Technology Maturation and Risk Reduction efforts for the Explosive Breaching capability.</p>	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 4					PE 0603619A / Landmine Warfare and Barrier - Adv Dev				BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
BU5: Standoff Volcano Obstacle (SAVO) Adv Tech	-	2.292	-	-	-	-	-	-	-	-	0.000	2.292
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project BU5 XM343 Standoff Activated Volcano Obstacle (SAVO) supports the United States Army Europe (USAREUR) Operational Needs Statement (ONS) # 18-22702 as well as revisions to the Multiple Delivery Mine System (Volcano) Joint Service Operational Requirement (JSOR) # 0683. This capability will allow for a formation of pre-emplaced directed obstacles that can be initiated remotely via fielded wired or wireless initiation systems.

XM343 SAVO can be initiated via one of three fielded systems; the M7 Spider Networked Munition System, the MK152/M156 Remote Activation Munition Systems (RAMS), or the CD450-4J Blasting Machine. SAVO can operate independently but can be used in conjunction with the Top Attack systems such as the XM204 Interim Top Attack system to create a complex obstacle. The primary item is the newly developed SAVO base plate which is placed on the ground and has four ports to connect fielded Volcano mine canisters. The base plate is packaged with ancillary components to aid in emplacement such as initiation wire, stabilizing ground stakes, sand bags, and canister carrying straps. If the emplaced obstacle is not initiated, SAVO can be recovered for future re-deployment.

This capability is compliant with the U.S. anti-personnel landmine policy and supports the U.S. Army modernization priorities in support of Multi Domain Operations (MDO).

SAVO Trainer base plates will reflect the form, fit, function, and weight of the tactical XM343 SAVO base plate. Trainer base plates interface with the fielded Volcano training canisters and are reusable. Upon receipt of a launch signal from a fielded initiation system, the training base plates produce sight and sound effects to effectively represent the SAVO obstacle's mine launch and armed status functionality.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: SAVO Rapid Prototyping	1.427	-	-
Description: SAVO system Rapid Prototyping phase.			
Title: Engineering Support	0.783	-	-
Description: Provide Engineering Support.			
Title: SAVO Management Services	0.045	-	-
Description: Program Management and Support			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev			Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech								
B. Accomplishments/Planned Programs (\$ in Millions)					FY 2022	FY 2023	FY 2024							
<i>Title:</i> SAVO Test & Evaluation					0.037	-	-							
<i>Description:</i> Provides support to Contractor/Government test activities.														
Accomplishments/Planned Programs Subtotals					2.292	-	-							
C. Other Program Funding Summary (\$ in Millions)														
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Base</u>	<u>FY 2024</u>	<u>OCO</u>	<u>FY 2024</u>	<u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• F76740: STANDOFF ACTIVATED VOLCANO OBSTACLE (SAVO), XM343	4.685	4.503	17.410	-	17.410	16.728	16.446	0.964	-	0.000	-	60.736		
Remarks														
D. Acquisition Strategy														
SAVO utilizes the Middle Tier of Acquisition pathway for Rapid Prototyping in accordance with Section 804 of the 2016 NDAA. The Rapid Prototyping phase leverages 10 U.S.C. 2371b "Other Transaction Authority" to award a competitive prototype contract. Prototypes will undergo a series of developmental tests ahead of qualification testing and operational assessment to support Initial Operational Capability scheduled for FY 2025.														

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SAVO Program Management Travel and Support	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	0.148	0.045	Jun 2022	-	-	-	-	-	-	-	0.000	0.193	-
SAVO Contractor Support	C/FFP	BOWHEAD : Alexandria VA	0.108	-	-	-	-	-	-	-	-	-	0.000	0.108	-
Subtotal		0.256	0.045										0.000	0.301	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPFF	Northrop Grumman Defense Systems : Plymouth, MN	14.025	1.427	Mar 2022	-	-	-	-	-	-	-	0.000	15.452	-
Subtotal		14.025	1.427										0.000	15.452	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SAVO - Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	3.710	0.783	Apr 2022	-	-	-	-	-	-	-	0.000	4.493	-
Human Research & Engineering (HRED) MANPRINT Support	MIPR	DEVCOM Army Research Laboratory - HRED : Aberdeen, MD	0.068	-	-	-	-	-	-	-	-	-	0.000	0.068	-
Subtotal		3.778	0.783										0.000	4.561	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Qualification Testing	MIPR	Yuma Test Center : Yuma, AZ	1.274	-		-		-		-		-	0.000	1.274	-
Electronic Environmental Effects E3 Testing	MIPR	White Sands Test Center : White Sands, NM	0.439	-		-		-		-		-	0.000	0.439	-
Electronic Environmental Effects E3 Testing	MIPR	Redstone Test Center : Huntsville, AL	0.290	0.037	Mar 2023	-		-		-		-	0.000	0.327	-
Subtotal			2.003	0.037		-		-		-		-	0.000	2.040	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			20.062	2.292		-		-		-		-	0.000	22.354	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army												Date: March 2023														
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)																		
2040 / 4				PE 0603619A / Landmine Warfare and Barrier - Adv Dev				BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech																		
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027	FY 2028									
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Rapid Prototyping OTA																										
Design Review 2	1																									
Doctrine Tactics and Training Event																										
Qualification Testing																										
Design Review 3	2																									
Operational Assessment																										
Production Decision Review																										
SAVO Production Contract																										
Urgent Materiel Release													5													
Initial Operational Capability																										
Full Operational Capability													6													
													7													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Rapid Prototyping Decision Review	3	2020	3	2020
Rapid Prototyping OTA	3	2020	4	2022
User Jury 1	2	2021	2	2021
Design Review 2	1	2022	1	2022
Doctrine Tactics and Training Event	2	2022	2	2022
Design Review 1	2	2021	2	2021
Qualification Testing	3	2022	3	2023
Design Review 3	1	2023	1	2023
Operational Assessment	1	2023	1	2023
Production Decision Review	3	2023	3	2023
SAVO Production Contract	4	2023	4	2028
Urgent Materiel Release	3	2025	3	2025
Initial Operational Capability	4	2025	4	2025
Full Operational Capability	3	2027	3	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)					
2040 / 4					PE 0603619A / Landmine Warfare and Barrier - Adv Dev				CE5 / Breaching Capability Development - Mounted					
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost		
CE5: Breaching Capability Development - Mounted	-	3.726	7.157	7.131	-	7.131	-	-	-	-	0.000	18.014		
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-				
A. Mission Description and Budget Item Justification														
The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles which does not support Multi-Domain Operations (MDO). This effort will focus on the development of the XM123 Ground Obstacle Breaching Lane Neutralizer (GOBLN) system, an MDO-capable modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhanced operational reliability, supportability, mobility and survivability beyond the current state. The target platforms for GOBLN are the Assault Breacher Vehicle (ABV), as well as the Remote Combat Vehicle (RCV). GOBLN has been endorsed by the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT) to fulfill the RCV breaching requirements. The modularity also allows for integration with other current and future platforms. The FY 2024 request supports continued Technology Maturation and Risk Reduction (TMRR), as well as a system-level concept demonstration / soldier touchpoint and pre-milestone B activities to support an FY26 MS-B.														
B. Accomplishments/Planned Programs (\$ in Millions)														
Title: XM123 Ground Obstacle Breaching Lane Neutralizer (GOBLN)										FY 2022	FY 2023	FY 2024		
Description: Develop the Next Generation Mounted Breaching capability to engage near-peer current and emerging threat obstacles.										3.726	6.896	7.131		
FY 2023 Plans: FY 2023 will support continued TMRR with subsystem development and testing and defining the final system architecture.														
FY 2024 Plans: FY 2024 will support continued TMRR, a system-level concept demonstration/soldier touchpoint, and preparation activities for an FY26 MS-B.														
FY 2023 to FY 2024 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.														
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)										-	0.261	-		
Description: Funding transferred in accordance with Title 15 USC §638														
FY 2023 Plans:														

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) CE5 / Breaching Capability Development - Mounted	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC §638 FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638		FY 2022	FY 2023
Accomplishments/Planned Programs Subtotals		3.726	7.157
7.131			
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy The Ground Obstacle Breaching Lane Neutralizer (GOBLN) Program of Record (POR) was established as an output of the Explosive Breacher Acquisition Shaping Panel Part 2 held on 13 June 2022 with Army Leadership. An Acquisition Decision Memorandum (ADM) is currently in staffing and is expected in 2QFY23. The goal of the TMRR phase is to integrate mature subsystems and hold a system-level concept demonstrations in FY24 and FY25 with MS-B occurring in FY 2026. The design will be refined in the Engineering and Manufacturing Development (EMD) phase through a single, competitively selected systems contractor utilizing a Government-developed Technical Data Package (TDP), with MS-C expected in FY 2028. It is expected that the EMD contract will include one or more LRIP option(s) to support deliveries in FY 2029, some of which will be utilized for operational testing expected to occur from 3QFY29 to 2QFY30. Initial Operational Capability (IOC) is expected in FY 2030 with FMR planned for FY 2031.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) CE5 / Breaching Capability Development - Mounted								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.261		-		-		-	0.000	0.261	-	
Subtotal				-	-	0.261		-		-		-	0.000	0.261	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
TMRR Development Government	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.892	Jul 2022	2.762	Feb 2023	3.630	Oct 2023	-		3.630	0.000	8.284	-	
Test Hardware	Various	Various : Various	-	-		1.000	May 2023	-		-		-	0.000	1.000	-	
Subtotal				-	1.892		3.762		3.630		-		3.630	0.000	9.284	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Sensor Modification and Integration	MIPR	DEVCOM C6ISR : Fort Belvoir, VA	-	0.768	Sep 2022	1.395	Mar 2023	1.410	Nov 2023	-		1.410	Continuing	Continuing	-	
Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.000	May 2022	1.000	Feb 2023	1.381	Oct 2023	-		1.381	Continuing	Continuing	-	
Warhead Specialist	C/CPFF	American Systems Corporation : Chantilly, VA	-	0.066	Aug 2022	0.049	Jan 2023	-		-		-	0.000	0.115	-	
Platform Virtual Integration	MIPR	DEVCOM GVSC : Warren, MI	-	-		0.240	Feb 2023	-		-		-	0.000	0.240	-	
Subtotal				-	1.834		2.684		2.791		-		2.791	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) CE5 / Breaching Capability Development - Mounted							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Level Test Support	MIPR	Army Test & Evaluation Command (ATEC) : Aberdeen, MD	-	-		-		0.710	Dec 2023	-		0.710	Continuing	Continuing	-
Sub-System Test Support	MIPR	Army Test & Evaluation Command (ATEC) : Various	-	-		0.450	Mar 2023	-		-		0.000	0.450	-	-
Subtotal			-	-	0.450			0.710		-		0.710	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	3.726		7.157		7.131		-		7.131	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603619A / Landmine Warfare and Barrier - Adv Dev				CE5 / Breaching Capability Development - Mounted							
Event Name	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	1	2	3	4	1	2	3	4
Technology Maturation and Risk Reduction															
Material Development Decision															
Touchpoint 1 (Launcher Subsystem Verification Test)															
Touchpoint 2 (Sensor/Detection Subsystem Demonstration)															
Touchpoint 3 (Neutralization Subsystem Verification)															
Soldier Touchpoint 4 (System Concept Demonstration)															
Soldier Touchpoint 5 (System Demonstration)															
Milestone B															
Engineering and Manufacturing Development															
Integration Testing															
Critical Design Review															
Milestone C															
LRIP Contract															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) CE5 / <i>Breaching Capability Development - Mounted</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Maturation and Risk Reduction	3	2021	4	2025
Material Development Decision	2	2023	2	2023
Touchpoint 1 (Launcher Subsystem Verification Test)	1	2023	1	2023
Touchpoint 2 (Sensor/Detection Subsystem Demonstration)	2	2023	2	2023
Touchpoint 3 (Neutralization Subsystem Verification)	4	2023	4	2023
Soldier Touchpoint 4 (System Concept Demonstration)	2	2024	3	2024
Soldier Touchpoint 5 (System Demonstration)	2	2025	3	2025
Milestone B	2	2026	2	2026
Engineering and Manufacturing Development	2	2026	1	2028
Integration Testing	2	2026	1	2028
Critical Design Review	3	2026	3	2026
Milestone C	2	2028	2	2028
LRIP Contract	3	2028	4	2029
Operational Testing	3	2029	2	2030

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
EK7: Area Denial Capability Development	-	38.915	54.796	40.406	-	40.406	6.165	6.165	6.229	6.298	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EK7 Area Denial Capability Development provides for the advanced capability development of Close Terrain Shaping Obstacle (CTSO) systems and develops modernized, non-persistent U.S. Anti-personnel landmine policy compliant munition fields. During joint, multi-domain, high intensity conflict CTSO systems disrupt, fix, turn and block enemy freedom of maneuver while enhancing friendly freedom of maneuver within the same battle space. CTSO systems enable maneuver commanders to directly influence where battlefield engagements occur. CTSO systems will replace a portion of the Family of Scatterable Mines (FASCAM) systems which are beyond their designed life.

The project will evaluate integrated technologies and develop prototype systems in a realistic operating environment for the next generation of CTSO systems to achieve doctrinally required obstacle effects during combat operations. CTSO systems will use an open system and modular architecture to facilitate future development, maintenance, repair, and product improvements.

XM204 Interim Top Attack program, the first CTSO capability insertion, has entered into production and will achieve Initial Operational Capability (IOC) by FY 2025 to meet United States Army Europe (USAREUR) Operational Needs Statement (ONS) #18-22702. XM204 can operate independently but can be used in conjunction with the Standoff Activated Volcano Obstacle (SAVO) system to create a complex obstacle.

The Army is incrementally developing an enduring solution to fill the close directed obstacle capability gap. The three increments are the Increment 1 (Top Attack), Increment 2 (Bottom Attack) and Increment 3 (Full Networked Capability) that comply with DoD Landmine Policy. Increments 1 and 2 provide the commander greater speed and flexibility to transition between offensive and defensive operations. Increment 3 Full Network Capability (FNC) will integrate the Top and Bottom Attack programs into Mission Command. The enduring CTSO capability development supports the approved Common Anti-Vehicular Munition (CAVM)-based Close Terrain Shaping Obstacle (CTSO) Abbreviated-Capability Development Document (A-CDD) and Army Futures Command (AFC) Terrain Shaping Strategy for Land Domain and Multi-Domain Operations (MDO). CAVM will be used for future mid and deep ranges in accordance with the AFC Terrain Shaping Strategy for Land Domain and MDO. CTSO systems are a networked munition capability suite composed of top and bottom attack munitions which can be employed independently or together to create a controlled, scalable complex obstacle.

The total cost of the CTSO Inc. 1 Middle Tier of Acquisition effort is \$101 million RDT&E from FY23 to FY24. The CTSO Inc. 1 MTA is fully funded across the Future Years Defense Program.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: Terrain Shaping Obstacles Capability Development	24.695	33.904	25.447

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 4	PE 0603619A / Landmine Warfare and Barrier - Adv Dev	EK7 / Area Denial Capability Development			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
<p>Description: Develop, build, and demonstrate Terrain Shaping Obstacle common munitions system. Demonstrate system in an operationally relevant environment.</p> <p>FY 2023 Plans: Complete XM204 ITA Urgent Materiel Release. Mature CTSO Increment 1 munition design against peer targets and demonstrate performance and lethality. Conduct research to address all fuzing and ammunition safety concerns. Conduct munition concept assessment for Common Anti-Vehicular Munition (CAVM) modular payload for future delivery methods. Complete Increment 1 prototype and demonstration during User Jury 1 of the obstacle planning tool, Remote Control Station (RCS), and the safety device. Demonstrate communication architecture and prepare for integration with munition prototype. Complete Preliminary Design Review.</p> <p>FY 2024 Plans: Complete CTSO Increment 1 munition design against peer targets and demonstrate performance and lethality. Conduct remaining updates of all fuzing and ammunition safety features to address certification pre-reviews. Demonstrate a fully integrated munition and communication prototype at User Jury 2 - shaping the AFC CDD that establishes final requirements for qualification and fielding. Coordinate and conduct Cyber Vulnerability Investigation to inform final cyber hardening design tasks. Complete Critical Design Review. Conduct Risk Reduction efforts for Bottom Attack Munitions to inform CTSO INC 2.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 decrease due to contractor finalizing maturation of prototypes and risk reduction at commercial facilities in preparation of USG testing in Government facilities the following year. U.S. Government will complete all required target procurement to support testing.</p>					
<p>Title: Engineering Support</p> <p>Description: Provide engineering support for Terrain Shaping Capability.</p> <p>FY 2023 Plans: Provide engineering support for CTSO Increment 1 system design documentation, User Jury 1, contractor component level testing, and preliminary design review.</p> <p>FY 2024 Plans: Provide engineering support for CTSO Increment 1 system design documentation, User Jury 2, contractor integration verification, and Critical Design Review. Leverage previous Test & Evaluation Strategy (TES) to develop the Test & Evaluation Master Plan (TEMP) to support progression towards system level qualification.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	10.843	13.764	11.222		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
2040 / 4	PE 0603619A / Landmine Warfare and Barrier - Adv Dev	EK7 / Area Denial Capability Development		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY 2024 decrease due to majority of testing remaining supports the risk reduction efforts at the contractor facilities. Efforts in FY2024 supports planning for contractor and government qualification testing planned for FY2025.				
Title: Program Management and Oversight Description: Program management and oversight of Terrain Shaping Obstacle Capability development and system evaluation. FY 2023 Plans: Provide program management and oversight of Terrain Shaping Obstacle Capability in support of development of the Increment 1 Top Attack Munition capabilities. FY 2024 Plans: Provide program management and oversight of Terrain Shaping Obstacle Capability in support of development and qualification of the Increment 1 Top Attack Munition capabilities.		0.113	0.362	0.362
Title: Test & Evaluation Description: Conduct testing and evaluation of Terrain Shaping Obstacle Capability performance. FY 2023 Plans: FY 2023 CTSO INC 1 Preliminary testing will be conducted on Cyber resilience and Threat's Countermeasures against first integrated prototype. Commencing contractor risk reduction testing; such as environmental and transportation testing. Conduct system sensor testing. Conduct simulated integrated operational performance. Develop models to support future system evaluation. Procures additional threat target vehicles for Increment 1 and repairs destroyed target vehicles from XM204 qualification. Target vehicles required for CTSO Increment 1 contractor verification testing. FY 2024 Plans: FY 2024 CTSO INC 1 Interim testing will be conducted on cyber vulnerabilities and Threat Countermeasures against fully integrated munition & communications prototypes. Complete Contractor risk reduction testing, such as environmental, transportation, and lethality testing. Conduct fully integrated system sensor testing. Conduct tests at environmentally relevant locations to assess performance. Conduct E3 testing to ensure final design of electrical architecture can remain operational under full operational stresses. Refine model inputs to support future system evaluation. Repairs destroyed target vehicles from CTSO Increment 1 contractor risk reduction tests and provides vehicle support for sensor test events for INC 1's expanded target suite. FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 decrease due to completion of rapid prototyping and maturation of technologies at contractor facilities to support system verification testing. The majority of testing remaining supports risk reductions at commercial facilities. USG facility testing will		3.264	4.985	3.375

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development			
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2022	FY 2023	FY 2024	
ramp up in following year and have completed purchasing of target vehicle purchases required to complete testing efforts in FY2024.										
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Description: Funding transferred in accordance with Title 15 USC §638 FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638 FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638							-	1.781	-	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	3.880	0.113	Nov 2021	0.362	Feb 2023	0.362	Dec 2023	-		0.362	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.781	Jan 2023	-	-	-	-	0.000	1.781	-	
Subtotal		3.880	0.113			2.143		0.362		-		0.362	Continuing	Continuing	N/A

Remarks
In FY 2022, funding in the amount of \$0.338 million for manpower was realigned to Operation and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CTSO INC 1 Rapid Prototype Development	C/CPFF	Textron Defense Systems : Wilmington, MA	-	5.970	Nov 2022	32.685	Feb 2023	23.447	Nov 2023	-		23.447	Continuing	Continuing	-
CTSO Munition Risk Reduction	Various	Various : Various	-	-		3.000	May 2023	2.000	Jun 2024	-		2.000	0.000	5.000	-
XM204 Capability Development	C/CPFF	Textron Defense Systems : Wilmington, MA	71.434	18.725	Nov 2021	-	-	-	-	-	-	0.000	90.159	-	
Subtotal		71.434	24.695			35.685		25.447		-		25.447	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DEVCOM Armaments Center Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	27.828	6.656	Jan 2022	7.536	Jan 2023	8.237	Dec 2023	-		8.237	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support	C/FFP	Bowhead : Picatinny Arsenal, NJ	1.347	-		0.661	May 2023	0.468	May 2024	-		0.468	Continuing	Continuing	-
DEVCOM Army Research Laboratory Engineering Support	MIPR	DEVCOM Army Research Laboratory : Adelphi, MD	2.232	0.312	Apr 2022	0.296	Mar 2023	0.301	Dec 2023	-		0.301	Continuing	Continuing	-
DEVCOM Data Analysis Center	MIPR	DEVCOM-DAC : Aberdeen Proving Ground, MD	1.667	0.811	May 2022	0.259	Mar 2023	0.264	Dec 2023	-		0.264	Continuing	Continuing	-
Milestone Document Development Support	SS/FFP	Booz Allen Hamilton : Picatinny Arsenal, NJ	6.000	0.951	May 2022	0.951	Mar 2023	0.951	May 2024	-		0.951	Continuing	Continuing	-
Logistics Suport	MIPR	CECOM ILSC : Aberdeen, MD	-	0.141	Jan 2023	0.029	Feb 2023	0.090	Dec 2023	-		0.090	Continuing	Continuing	-
Contractor Engineer Support	MIPR	American Systems INC : Chantilly, VA	0.200	0.076	Jul 2022	0.110	Mar 2023	0.076	Mar 2024	-		0.076	Continuing	Continuing	-
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	2.277	0.800	Oct 2022	1.240	Aug 2023	0.835	Aug 2024	-		0.835	Continuing	Continuing	-
Prototyping Development of Network and RF	MIPR	C6ISR Aberdeen Proving Ground : Aberdeen, MD	-	-		0.606	Mar 2023	-	-	-		0.000	0.606	-	-
NETT Warrior Center	MIPR	NETT Warrior : Tobyhanna, PA	-	-		0.236	Mar 2023	-	-	-		0.000	0.236	-	-
ENFIRE Support	MIPR	Product Director Combat Terrain Information Systems (PD-CTIS) : Aberdeen Proving Ground, MD	-	-		0.059	Mar 2023	-	-	-		0.000	0.059	-	-
XM204EOD Publication Book	MIPR	Naval Surface Warhead Center : Indian Head, MD	-	0.060	Dec 2022	-	-	-	-	-		0.000	0.060	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
XM204 C5ISR Contractor Support	MIPR	C6ISR Aberdeen Proving Ground : Aberdeen, MD	-	0.621	Jun 2022	-	-	-	-	-	-	-	0.000	0.621	-
C5ISR Ft Belvoir Engineering Support	MIPR	C6ISR Ft. Belvoir : Fort Belvoir, VA	-	0.415	Jun 2022	-	-	-	-	-	-	-	0.000	0.415	-
Subtotal		41.551	10.843		11.983		11.222		-	11.222	Continuing	Continuing		N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CTSO INC 1 E3 Personnel Electrostatic Discharge (PESD) & Helicopter (HESD) Risk Reduction Testing	MIPR	Picatinny Arsenal : Picatinny, NJ	-	-		-		0.100	Dec 2023	-	-	0.100	0.000	0.100	-
CTSO INC 1 E3 Hazards of Electronic Radiation to Ordnance (HERO) Risk Reduction Testing	MIPR	Whites Sands Missile Range : White Sands, NM	-	-		-		0.150	Dec 2023	-	-	0.150	0.000	0.150	-
CTSO INC 1 Environmental and Transportation Test	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		0.300	Jul 2023	0.400	Jan 2024	-	-	0.400	0.000	0.700	-
CTSO INC 1 Test and Evaluation Support	MIPR	Army Evaluation Center (AEC) : Aberdeen Proving Grounds, MD	-	-		0.015	Mar 2023	0.085	Jan 2024	-	-	0.085	0.000	0.100	-
CTSO INC 1 System Verification Testing Targets	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	-		2.750	Mar 2023	0.750	Apr 2024	-	-	0.750	0.000	3.500	-
CTSO INC 1 Warhead Evaluation Testing	MIPR	Iowa Army Ammunition Plant : Middletown, IA	-	-		-		0.200	Apr 2024	-	-	0.200	0.000	0.200	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CTSO INC 1 HERO E3 Testing	MIPR	White Sands Missile Range : White Sands, NM	-	-		-		0.260	Apr 2024	-		0.260	0.000	0.260	-
CTSO INC 1 User Jury 2	MIPR	Fort Leonardwood : Fort Leonardwood, MO	-	-		-		0.250	May 2024	-		0.250	0.000	0.250	-
CTSO INC 1 Warhead Assessment	MIPR	DEVCOM DAC : White Sands, NM	-	-		-		0.075	May 2024	-		0.075	0.000	0.075	-
CTSO INC 1 Ground Sensor Perf, C2 Sys Perf, CTR live Fire, End to End Testing	MIPR	Yuma Proving Ground : Yuma, AZ	-	-		-		0.500	Jun 2024	-		0.500	0.000	0.500	-
CTSO INC 1 Ground Sensor Perf, C2 Sys Performance Testing	MIPR	Aberdeen Proving Ground : Aberdeen, MD	-	-		-		0.500	Jun 2024	-		0.500	0.000	0.500	-
CTSO INC 1 E3 Direct Strike Lightning (DSL) Risk Reduction Testing	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	0.105	May 2022	-		0.105	Dec 2023	-		0.105	0.000	0.210	-
CTSO INC 1 User Jury 1	MIPR	Fort Leonardwood : Fort Leonardwood, MO	-	-		0.020	Jun 2023	-		-		-	0.000	0.020	-
CTSO INC 1 Cyber tabletop Exercise and Cooperative Vulnerability Identification	MIPR	DEVCOM DAC : White Sands, NM	-	-		0.010	May 2023	-		-		-	0.000	0.010	-
CTSO INC 1 Sensor Performance Testing	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		0.550	Aug 2023	-		-		-	0.000	0.550	-
CTSO INC 1 Cryptographic Module Validation Program	MIPR	DEVOM DAC : White Sands, NM	-	-		0.100	Aug 2023	-		-		-	0.000	0.100	-
CTSO INC 1 Penetration Assessment	MIPR	DEVCOM Data Analysis Center (DAC) : Aberdeen	0.087	-		0.075	Jun 2023	-		-		-	0.000	0.162	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Proving Grounds, MD													
CTSO INC 1 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		0.050	Mar 2023	-	-	-	-	-	0.000	0.050	-
CTSO INC 1 Operational Integration Test	MIPR	DEVCOM C6ISR NVESD Center : Fort Belvoir, VA	-	-		0.075	Apr 2023	-	-	-	-	-	0.000	0.075	-
Modeling & Simulation Advanced Joint Effectiveness Model(AJEM)	MIPR	DEVCOM Data Analysis Center (DAC) : Aberdeen Proving Grounds, MD	-	-		0.365	Mar 2023	-	-	-	-	-	0.000	0.365	-
Modeling & Simulation One Semi-Automated Forces (One SAF)	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.365	Jul 2022	0.050	Mar 2023	-	-	-	-	-	0.000	0.415	-
Modeling & Simulation Common Scene Generator	MIPR	Aviation & Missile Command : Redstone Arsenal, AL	-	-		0.625	Mar 2023	-	-	-	-	-	0.000	0.625	-
XM204 Operational Assessment	MIPR	Operational Test Command : Fort Hood, TX	0.289	0.916	Dec 2021	-		-	-	-	-	-	0.000	1.205	-
Govt System Verification Test	MIPR	Aberdeen Test Center : Aberdeen, MD	-	0.484	Dec 2021	-		-	-	-	-	-	0.000	0.484	-
CTSO XM204 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	0.049	Mar 2022	-		-	-	-	-	-	0.000	0.049	-
CTSO XM204 E3 Testing	MIPR	White Sands Missile Range : White Sands, NM	-	0.257	Mar 2022	-		-	-	-	-	-	0.000	0.257	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Adversarial Asessement	MIPR	Letterkenny Army Depot : Chambersberg, PA	-	0.008	Jun 2022	-	-	-	-	-	-	-	0.000	0.008	-
XM204 Top Attack Contractor Test Support	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	1.065	Aug 2022	-	-	-	-	-	-	-	0.000	1.065	-
Pallet Drop Testing	TBD	Naval Surface Warhead Center : Indian Head, MD	-	0.015	Sep 2022	-	-	-	-	-	-	-	0.000	0.015	-
XM204 Procure Target Vehicles	MIPR	Target Management Office (TMO) : Huntsville, AL	0.927	-	-	-	-	-	-	-	-	-	0.000	0.927	-
Subtotal		1.303	3.264		4.985		3.375		-		3.375	0.000	12.927	N/A	
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			118.168	38.915		54.796		40.406		-		40.406	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

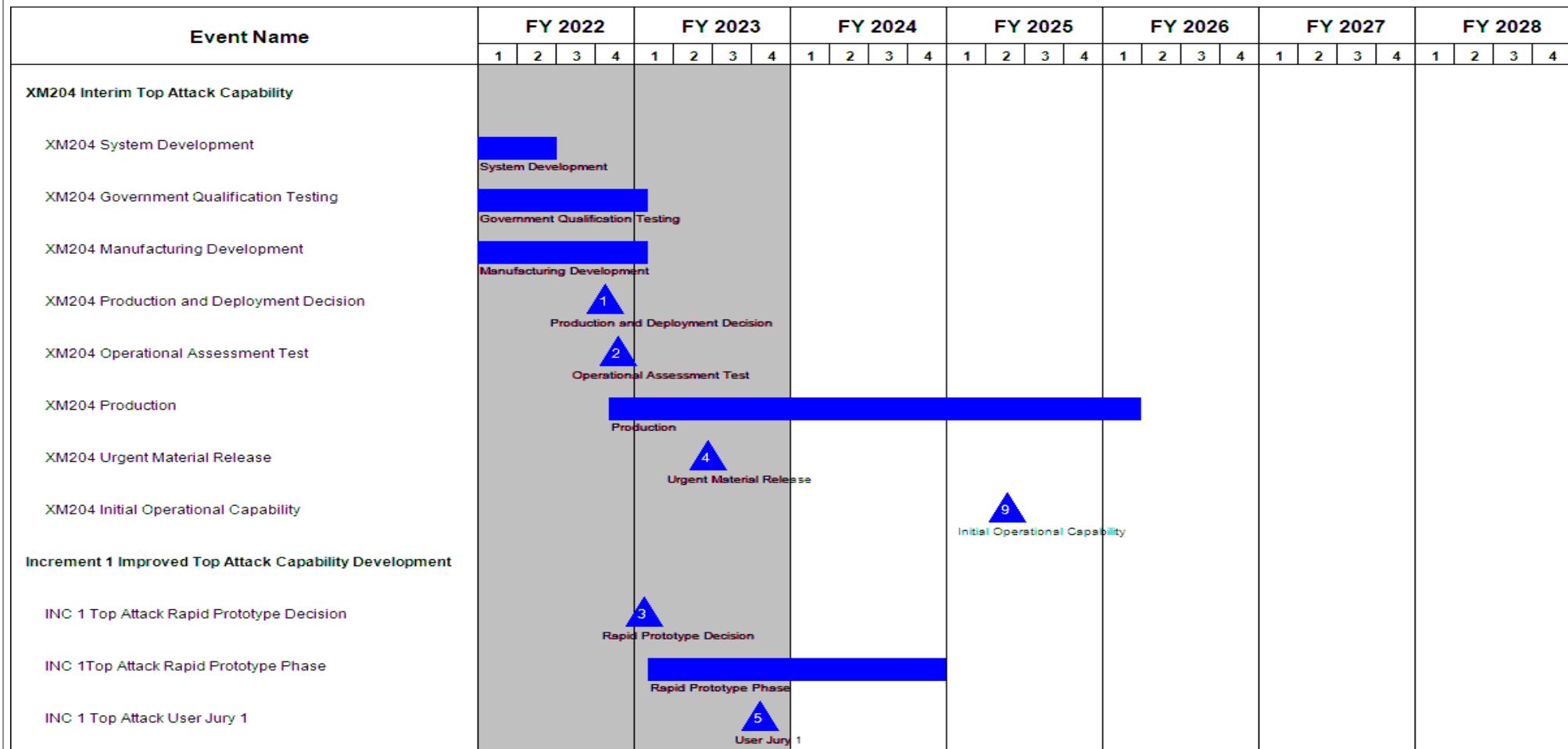
2040 / 4

R-1 Program Element (Number/Name)

PE 0603619A / Landmine Warfare and Barrier - Adv Dev

Project (Number/Name)

EK7 / Area Denial Capability Development



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

2040 / 4

R-1 Program Element (Number/Name)

PE 0603619A / Landmine Warfare and Barrier - Adv Dev

Project (Number/Name)

EK7 | Area Denial Capability Development

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4													PE 0603619A / Landmine Warfare and Barrier - Adv Dev				
Event Name				FY 2022				FY 2023				FY 2024				FY 2025	
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
INC 2 Bottom Attack User Jury 1																11 INC 2 User Jury 1	
INC 2 Bottom Attack User Jury 2																14 INC 2 User Jury 2	
INC 3 Full Network Capability																	16 Full Network Rapid Prot
INC 3 Full Network Prototype Decision																	Full Network
INC 3 Full Network Prototype Phase																	

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
XM204 Interim Top Attack Capability	4	2019	1	2026
XM204 Materiel Development Decision	4	2015	4	2015
XM204 Model and Simulation Development	1	2016	4	2018
XM204 Concept Prototype Agreements Award(s)	2	2016	2	2016
XM204 Concept Prototype Build	2	2016	4	2016
XM204 Concept Prototype Test and Evaluation	1	2017	1	2017
XM204 Analysis of Alternatives	1	2016	4	2016
XM204 Materiel Solution Analysis	1	2017	3	2019
XM204 Munitions Delivery System Analysis	4	2018	4	2019
XM204 Development Decision	3	2019	3	2019
XM204 Capability Development Award	4	2019	4	2019
XM204 User Jury	4	2019	4	2019
XM204 System Development	4	2019	2	2022
XM204 Prototype Testing	1	2020	2	2020
XM204 SubSystem Integration Testing	2	2020	2	2021
XM204 Preliminary Design Review	3	2020	3	2020
XM204 Critical Design Review	3	2021	3	2021
XM204 Government Qualification Testing	4	2021	1	2023
XM204 Manufacturing Development	4	2021	1	2023
XM204 Production and Deployment Decision	4	2022	4	2022
XM204 Operational Assessment Test	4	2022	4	2022
XM204 Production	4	2022	1	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development		
Events	Start		End	
	Quarter	Year	Quarter	Year
XM204 Urgent Material Release	2	2023	2	2023
XM204 Initial Operational Capability	2	2025	2	2025
TSO Future Capability Evaluation	2	2020	4	2021
TSO Development of Alternative Methods of Defeat	2	2020	4	2021
Increment 1 Improved Top Attack Capability Development	1	2023	1	2033
INC 1 Top Attack Rapid Prototype Decision	1	2023	1	2023
INC 1 Top Attack Rapid Prototype Phase	1	2023	4	2024
INC 1 Top Attack User Jury 1	4	2023	4	2023
INC 1 Top Attack Preliminary Design Review	4	2023	4	2023
INC 1 Top Attack User Jury 2	4	2024	4	2024
INC 1 Top Attack Critical Design Review	4	2024	4	2024
INC 1 Top Attack Qualification Testing	3	2025	4	2026
INC 1 MS C Decision	4	2026	4	2026
INC 1 Production and Deployment Phase	4	2026	1	2033
INC 1 Type Classification	1	2027	1	2027
INC 1 Top Attack IOT&E	3	2027	4	2027
INC 1 Full Material Release	4	2027	4	2027
INC 1 Initial Operational Capability	4	2028	4	2028
INC 2 Bottom Attack Capability	2	2025	2	2033
INC 2 Bottom Attack Rapid Prototype Decision	2	2025	2	2025
INC 2 Bottom Attack Rapid Prototype Phase	3	2025	3	2028
INC 2 Bottom Attack User Jury 1	2	2026	2	2026
INC 2 Bottom Attack User Jury 2	2	2027	2	2027
INC 3 Full Network Capability	3	2028	3	2031
INC 3 Full Network Rapid Prototype Decision	2	2028	2	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev		Project (Number/Name) EK7 / Area Denial Capability Development		
	Start		End		
Events	Quarter	Year	Quarter	Year	
INC 3 Full Network Prototype Phase	3	2028	3	2031	
INC 3 Full Network User Jury 1	3	2029	3	2029	
INC 3 Full Network User Jury 2	3	2030	3	2030	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603639A / Tank and Medium Caliber Ammunition								
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	-	61.641	51.488	91.323	-	91.323	99.578	103.058	68.532	53.842	Continuing	Continuing	
CD8: Long Range Precision Munition (LRPM)	-	12.936	13.265	43.693	-	43.693	49.648	59.528	24.543	9.363	0.000	212.976	
EB9: Aviation Airborne Expendable Countermeasures	-	5.327	-	-	-	-	-	-	-	-	0.000	5.327	
EC3: Ammunition Logistics Prototyping	-	2.062	1.839	1.892	-	1.892	1.931	1.932	1.952	1.973	0.000	13.581	
FA5: Assured Precision Weapons and Munitions	-	41.316	36.384	45.738	-	45.738	47.999	41.598	42.037	42.506	Continuing	Continuing	

A. Mission Description and Budget Item Justification

A portion of this funding line is directly aligned to each Future Vertical Lift (FVL) and Assured Positioning, Navigation, & Timing (APNT) Army Modernization Priorities. The Tank and Medium Caliber Ammunition Program Element encompasses a comprehensive program to develop, rapidly transition to production, and field advanced weapons and munitions for small, medium and large caliber munitions, tank ammunition, mortar ammunition, cannon artillery ammunition, and close combat system items. These Projects will ensure continued battlefield overmatch and lethality of United States maneuver forces against the full range of modern battlefield threats. To achieve this, Tank and Medium Caliber Ammunition projects will identify and develop promising technologies through competitive development and streamlined acquisition procedures.

Project CD8 - Long Range Precision Munition (LRPM) is an Army Aviation weapon that will provide leap ahead capability in the penetration and dis-integration phases of Joint All Domain Operations (JADO). The ability to interoperate and coordinate with other weapon systems and munitions at long ranges and adapt to changing threats is a core concept of the Army Aviation Weapons, Sub-Systems, and Munitions Initial Capability Document validated in July 2018, as well as the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 Aug 2022. Primary target set for LRPM is Integrated Air Defense Systems. LRPM will provide Army Aviation with a precise long range munition system to rapidly respond in a combat environment in order to improve the survivability of Warfighters and weapon systems, including aviation platforms in an Anti-Access Area Denial (A2AD) and positioning, navigation, and timing (PNT) denied environment.

Project EB9 - Project EB9 Aviation Airborne Expendable Countermeasure (AAECM) supports the advanced development activities and technology demonstrations of the AAECM to include the XM215 Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are essential parts for Army aircraft and will be employed with currently fielded countermeasures as a cocktail to provide protection against all threats. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical Aircraft Survivability Equipment (ASE) enabler for enduring aircraft and the Future Vertical Lift (FVL) Cross Functional Team (CFT) within the Army's top modernization priorities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)			
2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>			
These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. This program will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments. Prototypes will demonstrate component and subsystem maturity prior to integration into major Army aircraft platforms.				
<p>Project EC3 Ammunition Logistics Prototyping: This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This Project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2023 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.</p> <p>Project FA5 - The Assured Precision Weapons and Munitions (APWM) Project is focused on advanced risk mitigation, technology integration, prototyping, and product support to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapon and munitions components and subsystems within a complex system-of-systems (SoS) environment. The APWM Project reinforces the National Defense Strategy's major lines of effort through technology development and prototyping, which increases lethality and ensures future combat overmatch success of the Joint Force against peer/near-peer adversaries. This project also aims to improve program performance and affordability for multiple weapons and munitions Programs of Record (PoRs) via Joint Lethality Positioning, Navigation and Timing (PNT) Navigation Warfare (NavWar), and Army M-Code Global Positioning System (GPS) coordinated efforts. The APWM Project directly supports top Army Modernization Priorities via the Assured PNT/Space (APNT/S) and Long Range Precision Fires (LRPF) imperatives in support of the National Defense Strategy and multiple Public Law related Congressional imperatives. Funding will support engagement by weapons and munitions PNT experts in the development, evaluation, and technology delivery activities of the US Space Force's M-Code GPS, Army's PNT related programs, and APNT/S Cross-Functional Team (CFT) programs in support of LRPF and Counter Anti-Access/Area Denial (A2/AD) missions. Funding will also enable component and subsystem architecture input essential for Precision Weapons and Munitions (PW&M) operating in a SoS environment, Army M-Code GPS technology integration and evaluation, planning and evaluating next generation M-Code GPS to validate capability for future Joint precision munitions, and maturation of alternative PNT and NavWar related technologies and solutions to enable Resilient and Survivable PNT as well as making informed APNT related PoR milestone and Army cross-functional modernization decisions.</p>				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603639A / Tank and Medium Caliber Ammunition			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	73.844	64.669	78.962	-	78.962
Current President's Budget	61.641	51.488	91.323	-	91.323
Total Adjustments	-12.203	-13.181	12.361	-	12.361
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-13.100			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-12.203	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	12.361	-	12.361
• FFRDC Transfer	-	-0.081	-	-	-
Change Summary Explanation					
The FY24 change is due to an increase in project FA5 / Assured Precision Weapons and Munitions (APMW). The increase is needed in Fires APNT to maintain development pace with Joint APNT prototyping initiatives directly addressing Congressional mandates for resilient and survivable PNT and M- code. Maintaining pace avoids larger future integration APNT costs for M-Code Inc 2 (needed to address critical obsolescence and Joint Fires capability needs) and Software Defined Receivers to continue to outpace the threat maintaining Joint Fires overmatch.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603639A / Tank and Medium Caliber Ammunition				CD8 / Long Range Precision Munition (LRPM)				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
CD8: Long Range Precision Munition (LRPM)	-	12.936	13.265	43.693	-	43.693	49.648	59.528	24.543	9.363	0.000	212.976	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Long Range Precision Munition (LRPM) is an Army Aviation Weapon that will provide leap ahead capability in the penetration and dis-integration phases of Joint All Domain Operations (JADO). The ability to interoperate and coordinate with other weapon systems and munitions at long ranges and adapt to changing threats is a core concept of the Army Aviation Weapons, Sub-Systems, and Munitions Initial Capability Document validated in July 2018, as well as the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 August 2022. Primary target set for LRPM is Integrated Air Defense Systems. LRPM will provide Army Aviation with a precise long range munition system to rapidly respond in a combat environment in order to improve the survivability of Warfighters and weapon systems, including aviation platforms in an Anti-Access Area Denial (A2AD) and positioning, navigation, and timing (PNT) denied environment.

FY 2024 dollars in the amount of \$43.693 million includes LRPM program acquisition, contract documentation preparation and coordination, and technical evaluations leading to a contract award to mature and qualify the LRPM System.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: Long Range Precision Munition	12.936	12.781	43.693
Description: This line funds the demonstration, development, and validation of a munition system that will engage and render desired lethal effects on targets at ranges beyond line of sight. The LRPM development effort includes demonstration and validation of precision guided munitions with the capability to complete the assigned mission in environments that could include cyber-attack, countermeasures, counter precision guided munition systems and anti-access area denial environments. These efforts will include technical assessments, concept studies, performance of risk reduction efforts, technology maturation, engineering design, engineering / manufacturing development, test, demonstration of prototype hardware, platform integration of LRPM, and document preparation for associated contract and acquisition efforts.			
FY 2023 Plans: Complete review and analysis of the FY 2022 Capabilities Demonstration. Technology maturation and risk reduction efforts continue. Continue LRPM program acquisition and contract documentation preparation and coordination.			
FY 2024 Plans: Technology maturation and risk reduction efforts continue. Design Maturity, Modeling and Simulation maturation, and Prototype development will continue. Vendor(s) to provide deliverable(s) to include design and Modeling and Simulation. Continue LRPM program acquisition and contract documentation preparation and coordination. Complete acquisition activities & technical			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) <i>CD8 / Long Range Precision Munition (LRPM)</i>	
B. Accomplishments/Planned Programs (\$ in Millions) evaluations leading to an acquisition decision and contract award(s) to mature the LRPM design and modeling and simulation to determine system of systems technical feasibility.		FY 2022	FY 2023
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is due to contract award in FY 2024 to maintain continued vendor competition, material maturation, and development activities leading to a future design review.			
Title: FY 2023 SBIR/STTR Transfer		-	0.484
Description: Funding transferred in accordance with Title 15 USC § 638.			-
FY 2023 Plans: Funding transferred in accordance with Title 15 USC § 638.			
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC § 638.			
Accomplishments/Planned Programs Subtotals		12.936	13.265
43.693			
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy The LRPM program completed a Capability Demonstration in 4Q FY 2022-1Q FY 2023 to explore/leverage industry's ability to deliver a LRPM solution, wherein selected vendors delivered test assets in support of a United States Government Demonstration event. This demonstration event illustrated industry design concepts, technical approaches, and technology maturity to inform the LRPM CDD. Acquisition pathway decision is projected to occur 4Q FY 2023 after approval of the LRPM CDD. Contract award projected for 2Q FY 2024 to begin technology design and development activities.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) CD8 / Long Range Precision Munition (LRPM)							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/Program Management	Various	Various Performers : Various	-	4.350	Apr 2022	4.446	Nov 2022	3.750	Nov 2023	-		3.750	0.000	12.546	Continuing
Technical Evaluations	Various	Multiple Activities : Redstone Arsenal, Alabama	-	-		-		2.013	Nov 2023	-		2.013	0.000	2.013	Continuing
FY2023 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.484		-		-		-	0.000	0.484	-
Subtotal			-	4.350		4.930		5.763		-		5.763	0.000	15.043	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LRPM Other Government Agency	MIPR	CCDC Redstone Arsenal, AL : Various	-	3.403	Jun 2022	5.534	Nov 2022	2.724	Nov 2023	-		2.724	0.000	11.661	Continuing
System Development Maturation, Prototypes, and Integration	C/TBD	Multiple : Multiple	-	-		-		31.865	Mar 2024	-		31.865	0.000	31.865	Continuing
Engineering and Technical Support	Various	Various : Redstone Arsenal, Alabama	-	3.051	Apr 2022	2.801	Jan 2023	3.341	Jan 2024	-		3.341	0.000	9.193	Continuing
Subtotal			-	6.454		8.335		37.930		-		37.930	0.000	52.719	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Vendor Capability Demonstration	MIPR	Dugway Proving Ground : Dugway Utah	-	1.550	Jun 2022	-		-		-		-	0.000	1.550	Continuing
LRPM Other Government Agency	MIPR	Various Performers : Various	-	0.582	May 2022	-		-		-		-	0.000	0.582	Continuing
Subtotal			-	2.132		-		-		-		-	0.000	2.132	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army								Date: March 2023					
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition			Project (Number/Name) CD8 / Long Range Precision Munition (LRPM)							
Project Cost Totals	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
	-	12.936		13.265		43.693		-		43.693	0.000	69.894	N/A
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)							Project (Number/Name)										
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition							CD8 / Long Range Precision Munition (LRPM)										
Event Name				FY 2022				FY 2023				FY 2024				FY 2025					
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Capability Demonstration																					
Acquisition and Contract Preparation																					
System Development, Maturation, Prototypes, and Integration																					
Materiel Development Decision				1																	
Acquisition Pathway / Contract Determination								2													
Contract Award(s)												3									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) CD8 / <i>Long Range Precision Munition (LRPM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Capability Demonstration	1	2022	1	2023
Acquisition and Contract Preparation	1	2022	2	2024
System Development, Maturation, Prototypes, and Integration	2	2024	1	2031
Materiel Development Decision	2	2022	2	2022
Acquisition Pathway / Contract Determination	4	2023	4	2023
Contract Award(s)	2	2024	2	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603639A / Tank and Medium Caliber Ammunition				EB9 / Aviation Airborne Expendable Countermeasures				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
EB9: Aviation Airborne Expendable Countermeasures	-	5.327	-	-	-	-	-	-	-	-	0.000	5.327	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
Note													
Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev. Program transitions from prototyping phase into engineering and manufacturing development.													
A. Mission Description and Budget Item Justification													
Project EB9 Aviation Airborne Expendable Countermeasure (AAECM) supports the advanced development activities and technology demonstrations of the AAECM to include the XM215 Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are essential parts for Army aircraft and will be employed with currently fielded countermeasures as a cocktail to provide protection against all threats. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical Aircraft Survivability Equipment (ASE) enabler for enduring aircraft and the Future Vertical Lift (FVL) Cross Functional Team (CFT) within the Army's top modernization priorities.													
These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. This program will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments. Prototypes will demonstrate component and subsystem maturity prior to integration into major Army aircraft platforms.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024
Title: Expendable Countermeasures to Guided Missile Threats											5.327	-	-
Description: This program will develop expendable countermeasure decoys which will protect Army aircraft from surface-to-air missiles.													
Accomplishments/Planned Programs Subtotals											5.327	-	-
C. Other Program Funding Summary (\$ in Millions)													
Line Item	FY 2022	FY 2023	FY 2024	Base	OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• EP7: Aviation Airborne Expendable Countermeasures	7.251	6.363	3.194	-		3.194	3.208	0.932	-	-	0.000	20.948	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023
Appropriation/Budget Activity			R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4			PE 0603639A / Tank and Medium Caliber Ammunition				EB9 / Aviation Airborne Expendable Countermeasures				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• E49101: Flare, Aircraft Countermeasure, RF (Passive)	-	1.036	8.083	-	8.083	14.978	-	-	-	0.000	24.097
• E49102: Flare, Aircraft Countermeasure, XM215	-	-	0.000	-	0.000	0.860	0.538	8.279	9.574	Continuing	Continuing
Remarks											
Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev. Program transitions from prototyping phase into engineering and manufacturing development.											
D. Acquisition Strategy											
During the Materiel Solution Analysis (MSA), Milestone A phase, prototypes developed by the US Government (USG) and contractors were tested and evaluated against initial CDD requirements. The contractor developed XM20 design and the USG developed XM215 design were selected to enter into Engineering and Manufacturing Development (EMD), Milestone B phase, to finalize the design based on lessons learned from the MSA flight test and CDD requirements. Test assets are being procure from industry via Other Transaction Authority (OTA) contract mechanism in FY 2021 to support EMD. Final XM20 and XM215 and configurations to support production after MS C will be procured via Full and Open FAR based contracts.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EB9 / Aviation Airborne Expendable Countermeasures								
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
XM20 Testing Hardware	C/FFP	Armtec : Lillington, NC	-	0.912	Apr 2022	-	-	-	-	-	-	-	0.000	0.912	-	
Subtotal				0.912		-	-	-	-	-	-	-	0.000	0.912	N/A	
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
XM20 Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.734	2.352	Apr 2022	-	-	-	-	-	-	-	0.000	4.086	-	
Subtotal				1.734	2.352	-	-	-	-	-	-	-	0.000	4.086	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
XM20 Design Verification and Flight Testing	MIPR	Various : Various	4.079	2.063	Apr 2022	-	-	-	-	-	-	-	0.000	6.142	-	
Subtotal				4.079	2.063	-	-	-	-	-	-	-	0.000	6.142	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				5.813	5.327	-	-	-	-	-	-	-	0.000	11.140	N/A	
<u>Remarks</u>																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

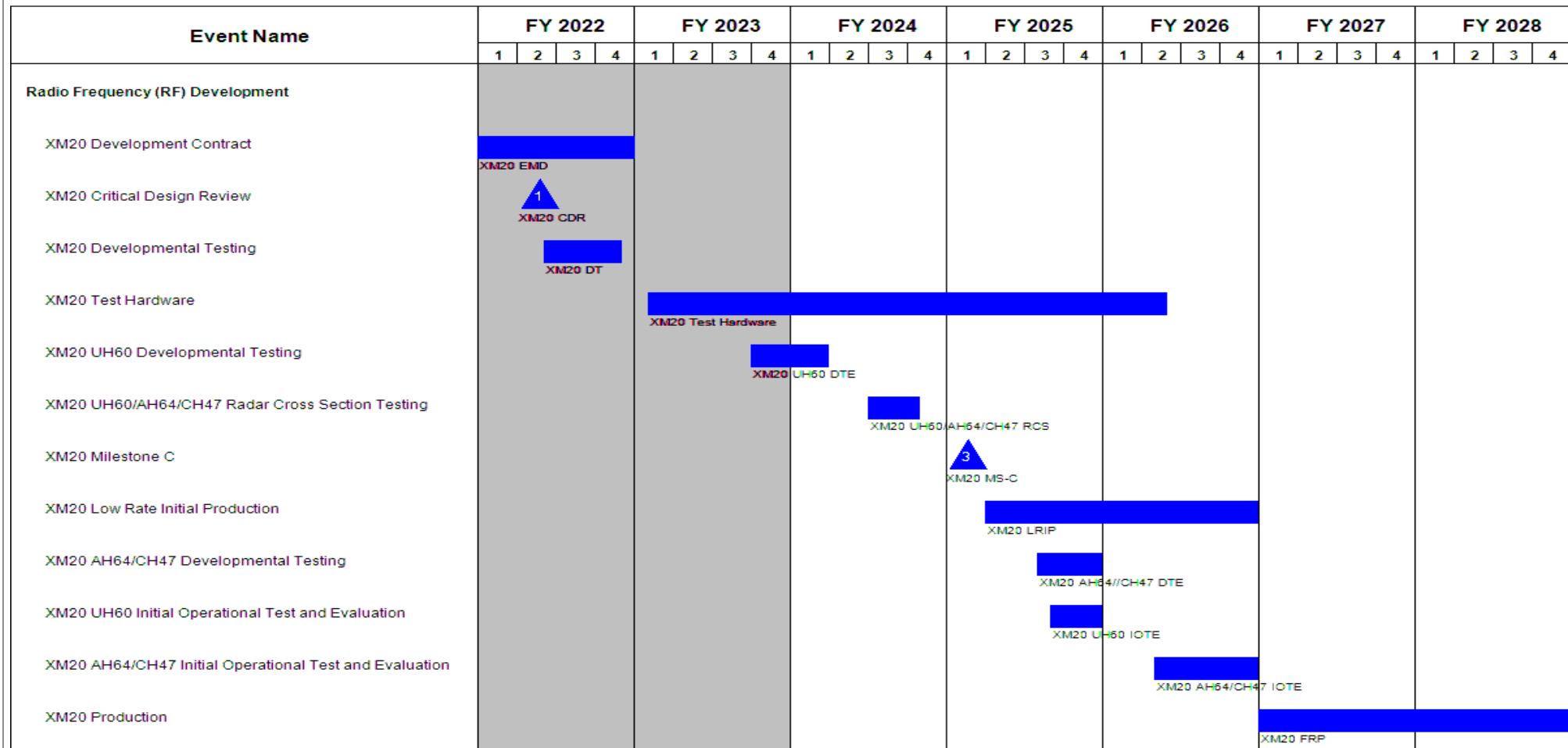
2040 / 4

R-1 Program Element (Number/Name)

PE 0603639A / *Tank and Medium Caliber Ammunition*

Project (Number/Name)

EB9 / *Aviation Airborne Expendable Countermeasures*



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EB9 / Aviation Airborne Expendable Countermeasures									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EB9 / Aviation Airborne Expendable Countermeasures		
Schedule Details				
Events		Start	End	
		Quarter	Year	Quarter
Radio Frequency (RF) Development		1	2019	4
XM20 Milestone A		1	2019	1
XM20 Prototype Development		1	2019	4
XM20 Demonstrations		2	2019	3
XM20 Technology Maturation and Risk Reduction		1	2020	2
XM20 Flight Testing		2	2020	2
XM20 Modeling and Simulation		3	2020	4
XM20 Data Analysis		1	2021	2
XM20 Milestone B		2	2021	2
XM20 Development Contract		2	2021	4
XM20 Critical Design Review		2	2022	2
XM20 Developmental Testing		2	2022	4
XM20 Test Hardware		1	2023	2
XM20 UH60 Developmental Testing		4	2023	1
XM20 UH60/AH64/CH47 Radar Cross Section Testing		3	2024	4
XM20 Milestone C		1	2025	1
XM20 Low Rate Initial Production		2	2025	4
XM20 AH64/CH47 Developmental Testing		3	2025	4
XM20 UH60 Initial Operational Test and Evaluation		3	2025	4
XM20 AH64/CH47 Initial Operational Test and Evaluation		2	2026	4
XM20 Production		1	2027	4
XM215 Development		1	2019	4

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EB9 / Aviation Airborne Expendable Countermeasures		
Events	Start		End	
	Quarter	Year	Quarter	Year
XM215 Milestone A	1	2019	1	2019
XM215 Prototyping	1	2019	2	2020
XM215 Down Select	3	2019	3	2019
XM215 Testing Efforts (Stability/Heat/Cold)	3	2019	2	2020
XM215 Flight Testing	1	2020	2	2020
XM215 Milestone B	2	2020	2	2020
XM215 Engineering and Manufacturing Development	2	2020	4	2023
XM215 Design Verification Test	2	2021	3	2021
XM215 Flight Test	2	2021	2	2021
XM215 Prototype Build	3	2021	4	2023
XM215 Flight Test 2	1	2023	1	2023
XM215 Developmental and Operational Testing	2	2023	4	2023
XM215 Milestone C	1	2024	1	2024
XM215 Low Rate Initial Production	1	2024	4	2026
XM215 Pattern Development	1	2024	1	2026
XM215 UH60/AH64 Seeker Bowl	3	2024	1	2025
XM215 CH47/FW Seeker Bowl	3	2025	1	2026
XM215 Full Rate Production	1	2027	4	2031

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603639A / Tank and Medium Caliber Ammunition				EC3 / Ammunition Logistics Prototyping				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
EC3: Ammunition Logistics Prototyping	-	2.062	1.839	1.892	-	1.892	1.931	1.932	1.952	1.973	0.000	13.581	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This Project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2024 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Munitions Health and Inventory Monitoring Systems	FY 2022	FY 2023	FY 2024
<p>Description: Performance and reliability of certain munitions can be degraded by the environmental exposure history they experience during their lifetime. This Project will develop simple to complex environmental health and inventory monitoring systems to improve reliability and asset visibility and enable effective Condition Based Management for Ammunition. All research and development initiatives will be supporting the Long Range Precision Fires (LRPF) & Soldier Lethality (SL) Cross Functional Teams (CFTs) and the multi domain operations modernization objectives that consume, store or transport/distribute munitions and munition components in the maneuver formations.</p> <p>FY 2023 Plans: Develop and mature prototype systems to monitor munition exposure throughout the tactical distribution system. Develop systems to monitor large caliber projectiles, associated propellant, fuzes, and any other ammunition components as packaging and transport/storage configurations evolve within the tactical distribution system. Integrate these monitoring systems with other ammunition management technologies.</p> <p>FY 2024 Plans: Develop and mature prototype systems to monitor munition environmental exposure beginning as ammunition is issued from the Ammunition Storage Areas and handed off to the sustainment formations. Develop a system architecture that can</p>	1.065	0.885	0.992

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 4	PE 0603639A / Tank and Medium Caliber Ammunition	EC3 / Ammunition Logistics Prototyping			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
efficiently collect environmental exposure to temperature, humidity, shock, and vibration while simultaneously correlating these parameters to ballistic performance. The first iteration of these prototypes will be supporting large caliber projectiles, associated propellant, fuzes, and any other ammunition components. As the packaging of long-range precision ammunition items for tactical transportation and distribution configurations evolve through modernization, surveillance reporting of environmental exposure will become critical to ensure lethality and readiness. Integrate these prototype systems with other ammunition management technologies and leverage existing Systems of Record such as the Command Post Computing Environment, Joint Battle Command - Platform, Paladin Digital Fire Control System, and Advanced Field Artillery Tactical Data System.					
FY 2023 to FY 2024 Increase/Decrease Statement: Slight increase due to projected increase in labor rates.					
Title: Munitions Containerization Systems Description: For each family of munitions containers, optimize prototype container systems for automation compatibility, combat unit load quantity, sustainability/recyclability, Inensitive Munitions/explosives safety, environmental protection, load reconfiguration, unitization, and standardized interfaces. This will improve ammunition distribution efficiency while minimizing environmental and operational impacts.	0.997	0.887	0.900		
FY 2023 Plans: Conduct qualification testing on plastic cylindrical injection molded containers and / or inner packaging components that are low cost, lightweight and incorporate features that will enable interoperability with future automated weapon and sustainment systems, for integration with ammunition items under development by PM CAS. Complete developmental testing on inner packaging barrier prototypes designed to protect new large caliber propellant items against environmental effects.					
FY 2024 Plans: Develop and test series of prototype ammunition consolidators suitable for providing protection to class V items as they are transported by tactical wheeled vehicle organic to the sustainment formations and handed off to the ammo section within the Fires formations. All consolidators must be compliant with the environmental sensor prototype under concurrent development elsewhere within the JPEO A&A portfolio, and incorporate automation friendly features. Prototype consolidator concepts will supplement potential inner-packaging components and stress low cost, lightweight and interoperability with future manual and automated weapon and sustainment systems with ammunition items under development by PM CAS as the primary goal.					
FY 2023 to FY 2024 Increase/Decrease Statement: Slight increase due to projected increase in labor rates.					
Title: SBIR/STTR Transfer FY 2023 Plans:	-	0.067	-		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EC3 / <i>Ammunition Logistics Prototyping</i>
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC 638		FY 2022
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638		FY 2023
	Accomplishments/Planned Programs Subtotals	FY 2024
	2.062	1.839
1.892		
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Fiscal Year (FY) 2023 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EC3 / Ammunition Logistics Prototyping							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.067		-		-		-	0.000	0.067	-
Subtotal				-	-	0.067		-		-		-	0.000	0.067	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Munitions Health Monitoring System (CAT)	C/FFP	Cybernet : Ann Arbor, MI	-	-		0.200	Jan 2023	0.470	Jan 2024	-		0.470	0.000	0.670	-
Tactical Munitions Health Monitoring System	C/FFP	Cybernet : Ann Arbor, MI	0.765	1.063	Jan 2022	0.275	Jan 2022	-		-		-	0.000	2.103	-
Large Caliber Automation Friendly Packaging	TBD	TBD : TBD	-	-		0.433	Mar 2023	-		-		-	0.000	0.433	-
Advanced Munitions Health Monitoring System (PLS)	TBD	CR Tactical : Pittsburgh, PA	-	-		-		0.462	Jan 2024	-		0.462	0.000	0.462	-
Lightweight Steel Container	TBD	SAVIT : Rockaway, NJ	-	-		-		0.300	Nov 2023	-		0.300	0.000	0.300	-
Subtotal				0.765	1.063	0.908		1.232		-		1.232	0.000	3.968	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DEVCOM Armaments Center	MIPR	Picatinny Arsenal : NJ	5.404	0.799	Nov 2021	0.664	Nov 2021	0.660	Nov 2023	-		0.660	0.000	7.527	-
Subtotal				5.404	0.799	0.664		0.660		-		0.660	0.000	7.527	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EC3 / Ammunition Logistics Prototyping							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	TBD : TBD	0.150	0.200	Mar 2022	0.200	Mar 2023	-	-	-	-	-	0.000	0.550	-
Subtotal		0.150	0.200		0.200		-		-		-		0.000	0.550	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			6.319	2.062		1.839		1.892		-		1.892	0.000	12.112	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)							Project (Number/Name)										
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition							EC3 / Ammunition Logistics Prototyping										
				FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028					
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Tactical Munitions Health Monitoring System					Tactical Munitions Health Monitoring System																
Large Caliber Automation Friendly Packaging					Large Caliber Automation Friendly Packaging																
Advanced Munitions Health Monitoring System (CAT)					Advanced Munitions Health Monitoring System (CAT)																
Advanced Munitions Health Monitoring System (PLS)					Advanced Munitions Health Monitoring System (PLS)																
Lightweight Steel Container					Lightweight Steel Container																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EC3 / <i>Ammunition Logistics Prototyping</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Advanced Concept Development-Munitions Containerization-1A	1	2020	4	2021
Advanced Concept Development-Munitions Health Monitoring-3	3	2017	4	2020
Tactical Munitions Health Monitoring System	1	2022	4	2024
Large Caliber Automation Friendly Packaging	1	2023	4	2025
Advanced Munitions Health Monitoring System (CAT)	2	2024	2	2026
Advanced Munitions Health Monitoring System (PLS)	2	2024	2	2026
Lightweight Steel Container	1	2024	1	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603639A / Tank and Medium Caliber Ammunition				FA5 / Assured Precision Weapons and Munitions				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
FA5: Assured Precision Weapons and Munitions	-	41.316	36.384	45.738	-	45.738	47.999	41.598	42.037	42.506	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The Assured Precision Weapons and Munitions (APWM) - FA5 Project is focused on advanced risk mitigation, technology integration, prototyping, and product support to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapon and munitions components and subsystems within a complex system-of-systems (SoS) environment. The APWM Project reinforces the National Defense Strategy's major lines of effort through technology development and prototyping, which increases lethality and ensures future combat overmatch success of the Joint Force against peer/near-peer adversaries. This project also aims to improve program performance and affordability for multiple weapons and munitions Programs of Record (PoRs) via Joint Lethality Positioning, Navigation and Timing (PNT) Navigation Warfare (NavWar), and Army M-Code Global Positioning System (GPS) coordinated efforts. The APWM Project directly supports top Army Modernization Priorities via the Assured PNT/Space (APNT/S) and Long Range Precision Fires (LRPF) imperatives in support of the National Defense Strategy and multiple Public Law related Congressional imperatives. Funding will support engagement by weapons and munitions PNT experts in the development, evaluation, and technology delivery activities of the US Space Force's M-Code GPS, Army's PNT related programs, and APNT/S Cross-Functional Team (CFT) programs in support of LRPF and Counter Anti-Access/Area Denial (A2/AD) missions. Funding will also enable component and subsystem architecture input essential for Precision Weapons and Munitions (PW&M) operating in a SoS environment, Army M-Code GPS technology integration and evaluation, planning and evaluating next generation M-Code GPS to validate capability for future Joint precision munitions, and maturation of alternative PNT and NavWar related technologies and solutions to enable Resilient and Survivable PNT as well as making informed APNT related PoR milestone and Army cross-functional modernization decisions.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: APWM Integrated Product Support - Joint Lethality PNT and Navigation Warfare (NavWar) SME Working Integrated Product Team (WIPT) & Program Management	FY 2022	FY 2023	FY 2024
Description: Provide APWM technical subject matter expertise and support to the Joint oversight board for APWM. Provide overall APWM Project Program Management support.	3.600	3.744	3.848

FY 2023 Plans:
Provides overall Project Program Management support for 643639A-FA5. The Joint Lethality SMEs will continue to provide technical expertise and support to the Joint oversight board for Assured Precision Weapons and Munitions by coordinating with and supporting the development and technology delivery activities of the Joint Weapons and Munitions community, to include PNT modernization and NavWar related programs, participation in design reviews, evaluation and formal feedback on technology and systems requirements and performance, component and subsystem architecture input essential for precision weapons and

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) <i>FA5 / Assured Precision Weapons and Munitions</i>	
B. Accomplishments/Planned Programs (\$ in Millions) munitions operating in a Joint SoS multi-domain environment. Specific support focus includes requirements for MGUE Increment 2, resilient and survivable PNT technology maturation, and NavWar dependencies.		FY 2022	FY 2023
FY 2024 Plans: Provides overall Project Program Management support for 643639A-FA5. The JL SMEs will continue to provide technical expertise and support to the Joint oversight board for Assured Precision Weapons and Munitions by coordinating with and supporting the development and technology delivery activities of the Joint Weapons and Munitions community, to include PNT modernization and NavWar related programs, participation in design reviews, evaluation and formal feedback on technology and systems requirements and performance, component and subsystem architecture input essential for precision weapons and munitions operating in a Joint SoS multi-domain environment. Specific support focus includes requirements and virtual prototyping for MGUE Increment 2, resilient and survivable PNT technology maturation, NavWar dependencies, and direct participation in new technology areas such as PGM Software Defined Receivers.			
FY 2023 to FY 2024 Increase/Decrease Statement: Level of effort slightly increased from FY23 to FY24 due to the ongoing APNT/S CFT and US Space Force's MGUE program efforts, maturing NavWar initiatives, and increasing complexity of multi-domain operations impacting collaborative efforts for the Joint Lethality community.			
Title: Fires System-of-Systems APNT related AS and NavWar Description: Prototype PNT enabling technologies that are critical for executing Fires SoS NavWar missions to include munition-based offensive, defensive, and associated Command and Control (C2) functions. Prototyping efforts will focus on enabling combat lethality overmatch in PNT challenged environments for cannon and rocket/missile core missions. Prototype long range stand-off NavWar capability to penetrate contested A2/AD environments via use of long-range artillery, Fires SoS architectures enabling advanced NavWar attack, sense, and optimization, and advanced anti-jam/anti-spoof techniques for munitions.	5.000	-	-
Title: Next Generation PNT Technologies Phase 1 Description: Continue prototyping APNT technologies to provide the next generation of APNT capability to weapons and munitions in a highly complex and fast paced battlefield. Will leverage prior Army Science &Technology (S&T), previous integrated demonstration events, information on threat advancement, and lessons learned to rapidly develop, integrate, prototype, and transition critical APNT technologies to weapons and munitions directly supporting LRPF and Air & Missile Defense initiatives.	1.216	2.268	-
FY 2023 Plans: Demonstrate resilient and survivable PNT solutions for weapons and munitions using results of phase 1 spiral APNT technology solutions in complex PNT threat environments.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Funding decreases due to Next Gen PNT Technologies Phase I transitioning to Next Gen NavWar Tech Phase I, and PGM SDRx Phase II for continued maturation and transition to Fires PORs.				
Title: Rocket/Missile Precision Guided Munition M-Code Prototyping	6.000	-	-	
Description: Directly supports M-Code public law by rapidly prototyping M-Code receivers for direct transfer to rocket/missile systems.				
Title: Munition Deployed NavWar Countermeasures	6.000	-	-	
Description: Prototype, integrate, and experiment with initial increment of Munition Deployed NavWar Countermeasures (MDNC) and weapons and munitions SoS dependencies directly supporting APNT/S CFT NavWar initiatives and LRPF initiative of penetrating, disrupting, and disintegrating A2/AD environments to enable employment of precision weapons and munitions.				
Title: Assured PNT related Weapons & Munitions Prototyping - PGM Software-Defined Receiver (SDRx)	6.000	5.329	-	
Description: Develop a prototype "All In One" GPS, Global Navigation Satellite System (GNSS), Alternative Navigation (AltNav), Signals of Opportunity (SoO) software defined radio frequency APNT receiver for a large portion of the PGM portfolio.				
FY 2023 Plans: Continue to develop diverse RF Basic Navigation functions required for a prototype PGM SDRx and initiate GPS security certification process.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding is decreased due to transition of PGM SDRx Phase I prototyping results to PGM SDRx Phase II for physical prototyping and eventual live fire demonstrations.				
Title: Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation	12.000	12.420	11.902	
Description: Provide technical assessment, coordination, and engineering support related to the development, prototyping, integration, and evaluation of US Space Force's MGUE technology deliverables across all Army Weapons and Munitions, including participation in design reviews, testing, evaluation, and formal feedback on technology, component-level, card-level, sub-system-level, and systems-level requirements and performance. Reduce risk, support, and inform M-Code GPS related Army cross-functional modernization decisions for weapons and munitions operating in a peer/near threat SoS environment as well as identifying complementary PNT and NavWar related solutions when M-Code GPS is not solely sufficient to enable Combat Overmatch.				
FY 2023 Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) <i>FA5 / Assured Precision Weapons and Munitions</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
Continues to support design reviews, experimentation, prototyping, testing, evaluation, and risk reduction of Army M-Code Inc2, AltNav, and NavWar by in-house government activities and OTA/IDIQ Contract efforts. Maintains an Army APNT and NavWar Weapons and Munitions IPT working directly with the APNT/S CFT and multiple PEOs. Facilitate weapon and munition APNT and NavWar experimentation in PNT Assessment (PNTAX) and Project Convergence type events to inform CONOPS and requirement generation processes.			
FY 2024 Plans: Continues to support design reviews, experimentation, prototyping, testing, evaluation, and risk reduction of Army M-Code Inc2, AltNav, and NavWar by in-house government activities and OTA/IDIQ Contract efforts. Maintains an Army APNT and NavWar Weapons and Munitions IPT working directly with the APNT/S CFT and multiple PEOs. Facilitate weapon and munition APNT and NavWar experimentation in PNTAX and Project Convergence type events to inform CONOPS and requirement generation processes.			
FY 2023 to FY 2024 Increase/Decrease Statement: Level of effort required in FY24 is similar to FY23. Army APNT and NavWar Technology Integration Evaluation decreases slightly due to shift in focus on MGUE Inc2 for JROC-directed PGM Lead Platform.			
Title: MGUE Inc2 for JROC-directed PGM Lead Platform Description: Influence next generation MGUE development to ensure precision guided munition needs and requirements are met with the US Space Force (USSF) next generation MGUE. Evaluate the next generation MGUE to verify and validate PGM needs and requirements are met by next generation MGUE.		1.500	11.295
FY 2023 Plans: Work directly with USSF and M-Code Inc2 GPS prime vendors to start virtually prototyping and conducting PGM application specific design trade studies to reduce risk of integration into LR PGK, as the JROC-approved selected representative PGM for next generation ASIC verification and validation ensuring PGM PNT-related needs and requirements are met by MGUE Inc2.			17.030
FY 2024 Plans: Work directly with USSF and M-Code Inc2 GPS prime vendors to mature PGM specific design trade studies leading to a completed virtual prototype. Begin PGM M-Code Inc2 Circuit Card Assembly (CCA) designs with PGM specific software development reducing risk to accept USSF ASIC prototypes. Virtually prototype JROC-directed representative PGM Lead Platform design modifications to accept USSF M-Code Inc2 prototype technology for next generation ASIC verification and validation ensuring PGM PNT-related needs and requirements are met by MGUE Inc2.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) <i>FA5 / Assured Precision Weapons and Munitions</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
Funding increases in FY24 due to level of effort significantly increasing to perform prototyping across multiple levels of integration. Prototyping will be executed across the ASIC, CCA, guidance navigation and control unit, and supporting Fire Control C2 systems to reduce risk of accepting USSF M-Code Inc2 technology to verify and validate Joint Fires Requirements.			
Title: SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC §638		-	1.328
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638			-
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638			
Title: Next Generation NavWar Tech Phase 1 Description: Continue prototyping NavWar technologies across weapons and munitions needed to continue to dominate the PNT battlespace. Will leverage prior Army and Joint Services S&T, previous integrated demonstration events, information on threat and adversary PNT advancement, and lessons learned to rapidly develop, integrate, prototype, and transition critical NavWar technologies. Prototyping will transition to new Fuze Setter functions, MDN upgrades, and hardening of APNT systems to counter new threats, and control adversaries PNT access.		-	3.358
FY 2024 Plans: Continue prototyping NavWar attack, sense, and countermeasure technologies to preserve weapon and munition access to PNT, while dominating adversary access to PNT. Phase 1 technologies will advance data collect and use of NavWar situational awareness for Fires to enhance lethality and ensure effects on target(s) in complex threat environments.			
FY 2023 to FY 2024 Increase/Decrease Statement: Next Gen NavWar Tech Phase 1 continues to mature and prototype NavWar technology from Fires SoS APNT related AS and NavWar and Next Gen PNT technologies Phase 1, while transitioning new S&T technology capabilities from DEVCOM Centers (Combat Capabilities Development Command (CCDC) Armaments Center, CCDC Aviation and Missile Center and CCDC Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR)). Funding increase due to transition of multiple technologies into Next Gen NavWar Tech Phase 1.			
Title: PGM Software Defined Receiver (SDRx) Phase II		-	9.600

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 4	PE 0603639A / Tank and Medium Caliber Ammunition	FA5 / Assured Precision Weapons and Munitions			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
Description: Use PGM SDRx Phase I results to complete a prototype "All In One" APNT (GPS, GNSS, AltNav, SoO), SDRx for a large SWAP PGMs that is ready to transition to Army Fires PoRs, directly addressing the FY21 NDAA Section 1611 Congressional mandate for resilient and survivable PNT.					
FY 2024 Plans: Use results of PGM SDRx Phase I prototyping to develop physical prototypes for use in experimentations and evaluations of technology capabilities. Formalize USSF security certification target to reduce risk of obtaining a security certified PGM SDRx capable of M-Code GPS using Commercial-off-the-Shelf (COTS) components.					
FY 2023 to FY 2024 Increase/Decrease Statement: Funding is increased due to transition of PGM SDRx Phase I prototyping results to PGM SDRx Phase II. PGM SDRx Phase II leverages PGM SDRx Phase I prototype results to develop physical prototypes for use in evaluation across Army Fires and eventual live fire demonstration facilitating transition of SDRx technology across Fires directly addressing FY21 NDAA Section 1611. Increase also due to increased coordination with USSF to achieve military GPS security certification of the PGM SDRx Phase II prototype.					
	Accomplishments/Planned Programs Subtotals		41.316	36.384	45.738
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
Acquisition Strategy: The Assured Precision Weapons and Munitions Project will utilize a combination of Other Transaction Authority (OTA) contract mechanisms such as the Defense Ordnance Technology Consortium (DOTC) OTA and In-House government development and engineering capabilities to obtain prototypes and demonstrate/evaluate the maturity and integration risk of the M-Code GPS on Precision Munitions and Weapons, as well as other alternative PNT and NavWar related capabilities and corresponding related prototype system-of-systems solutions.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) FA5 / Assured Precision Weapons and Munitions							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FY23 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.328		-		-		-	0.000	1.328	-
Subtotal			-	-		1.328		-		-		-	0.000	1.328	N/A

Remarks

In FY 2022, funding in the amount of \$0.450 million for manpower was realigned to Operation and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Assured PNT related Munitions Integration Prototyping	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	11.786	5.000	Dec 2021	2.258	Dec 2022	-		-		-	0.000	19.044	-
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation	MIPR	Various : Various	12.622	7.200	Dec 2021	9.900	Dec 2022	-		-		-	0.000	29.722	-
Weapon & Munitions Prototyping & Integration Risk Mitigation	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD; Various : Various	-	15.666	Dec 2021	3.939	Dec 2022	-		-		-	0.000	19.605	-
MGUE Inc2 for JROC directed PGM Lead Platform Development	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	-	-		8.689	Dec 2022	-		-		-	0.000	8.689	-
Fires APNT	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD; Various : Various	-	-		-		24.288	Dec 2023	-		24.288	Continuing	Continuing	Continuing
Fires NavWar	MIPR	DoD Ordnance Technology	-	-		-		4.532	Dec 2023	-		4.532	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) FA5 / Assured Precision Weapons and Munitions							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Consortium (DOTC) - TBD; Various : Various													
Fires Systems of Systems APNT and NavWar	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD; Various : Various	-	-		-		4.533	Dec 2023	-		4.533	Continuing	Continuing	Continuing
Subtotal			24.408	27.866		24.786		33.353		-		33.353	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Joint Program Executive Office Armaments and Ammunition (JPEO A&A) : Picatinny Arsenal, NJ	4.597	1.250	Dec 2021	1.278	Dec 2022	-		-		-	0.000	7.125	2.858
Assured Precision Weapons and Munitions IPT Support	MIPR	Various : Various	8.464	2.400	Dec 2021	2.466	Dec 2022	-		-		-	0.000	13.330	9.726
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation Support. (Multiple PEO Sup)	MIPR	Various : Various	1.500	5.200	Dec 2021	2.520	Dec 2022	-		-		-	0.000	9.220	-
Assured Technologies Engineering Support	MIPR	DEVCOM : Picatinny Arsenal, NJ	3.796	2.500	Dec 2021	1.000	Dec 2022	-		-		-	0.000	7.296	1.991
Assured Technologies Engineering Support	MIPR	Communication Electronics Research, Development and Engineering	1.671	0.400	Dec 2021	0.200	Dec 2022	-		-		-	0.000	2.271	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) FA5 / Assured Precision Weapons and Munitions							
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Center (C5ISR) : Aberdeen Proving Ground, MD													
Assured Technologies Engineering Support	MIPR	Aviation and Missiles Center (AvMC) : Redstone Arsenal, AL	-	0.200	Dec 2021	0.200	Dec 2022	-		-		-	0.000	0.400	-
MGUE Inc2 for JROC-directed PGM Lead Platform Support	MIPR	Combat Capability Development Command Armament Center (CCDC AC) : Picatinny Arsenal, NJ	2.571	1.500	Dec 2021	2.606	Dec 2022	-		-		-	0.000	6.677	-
Program Management and Integrated Product Support	Various	Various : Various	-	-		-		3.848	Dec 2023	-		3.848	Continuing	Continuing	Continuing
Fires APNT	Various	Various : Various	-	-		-		6.070	Dec 2023	-		6.070	Continuing	Continuing	Continuing
Fires NavWar	Various	Various : Various	-	-		-		1.334	Dec 2023	-		1.334	Continuing	Continuing	Continuing
Fires Systems of Systems APNT and NavWar	Various	Various : Various	-	-		-		1.133	Dec 2023	-		1.133	Continuing	Continuing	Continuing
Subtotal			22.599	13.450		10.270		12.385		-		12.385	Continuing	Continuing	N/A
Remarks				Support consists of labor, travel and other non-labor costs in Fiscal Year (FY) 2022.											
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			47.007	41.316		36.384		45.738		-		45.738	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)							Project (Number/Name)										
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition							FA5 / Assured Precision Weapons and Munitions										
				FY 2022				FY 2023				FY 2024				FY 2025					
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Integrated Product Support																					
Joint Lethality PNT and NavWar SME WIPT (systems Enginee...																					
Program Management																					
Fires APNT																					
MGUE Inc2 for JROC-directed PGM Lead Platform																					
Accelerate NAVSTORM-M-Integration																					
Next Gen PNT Technologies Phase 1																					
PGM Software Defined Receiver (Phase 1)																					
PGM Software Defined Receiver (Phase 2)																					
Rocket/Missile PGM M-Code Prototyping																					
Next Gen PNT Technologies Phase 2																					
Advanced multi-source PNT solutions for Precision Weapon...																					
Army APNT (incl M-Code) and NavWar Technology Integratio...																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)												
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				FA5 / Assured Precision Weapons and Munitions												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		FY 2028		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Fires NavWar																				
Next Gen NavWar Technology																				
Munition Deployed NavWar Countermeasures																				
Munition Deployed NavWar Dual Mode Attack/Sense Phase 1																				
Munition Deployed NavWar Dual Mode Attack/Sense Phase 2																				
Multi-mode/Multi-mission Munition Deployed NavWar																				
Munition Deployed NavWar multi-spectral countermeasures ...																				
Army APNT (incl M-Code) and NavWar Technology Integratio...																				
Fires SoS APNT related AS and NavWar																				
Network Assisted Assured PNT and NavWar Phase 1																				
Network Assisted Assured PNT and NavWar for MDO Phase 1																				
Army APNT (incl M-Code) and NavWar Technology Integratio...																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions		
Schedule Details				
Events	Start	End	Quarter	Year
Integrated Product Support	1	2017	4	2033
Joint Lethality PNT and NavWar SME WIPT (systems Engineer Support & Integration)	1	2017	4	2033
Program Management	1	2017	4	2033
Fires APNT	1	2017	4	2033
MGUE Inc2 for JROC-directed PGM Lead Platform	1	2022	4	2027
Accelerate NAVSTORM-M-Integration	3	2021	3	2022
Next Gen PNT Technologies Phase 1	1	2021	4	2023
PGM Software Defined Receiver (Phase 1)	1	2022	4	2023
PGM Software Defined Receiver (Phase 2)	1	2024	4	2025
Rocket/Missile PGM M-Code Prototyping	1	2022	4	2022
Next Gen PNT Technologies Phase 2	1	2027	4	2028
Advanced multi-source PNT solutions for Precision Weapons and Munitions Phase 1	1	2029	4	2030
Advanced multi-source PNT solutions for Precision Weapons and Munitions Phase 2	1	2031	4	2032
Autonomous Integration of multi-Source PNT for Precision Weapons and Munitions	1	2033	4	2033
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation - Fires APNT	1	2024	4	2028
Fires NavWar	1	2017	4	2033
Next Gen NavWar Technology	1	2024	4	2025
Munition Deployed NavWar Countermeasures	1	2022	4	2022
Munition Deployed NavWar Dual Mode Attack/Sense Phase 1	1	2025	4	2026
Munition Deployed NavWar Dual Mode Attack/Sense Phase 2	1	2027	4	2028
Multi-mode/Multi-mission Munition Deployed NavWar	1	2029	4	2030

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions		
Events	Start		End	
	Quarter	Year	Quarter	Year
Multi-mode/Multi-mission Munition Deployed Advanced NavWar	1	2031	4	2032
Munition Deployed NavWar multi-spectral countermeasures Phase 1	1	2029	4	2030
Munition Deployed NavWar multi-spectral countermeasures Phase 2	1	2031	4	2032
Integrated Passive and Active Munition Deployed NavWar	1	2033	4	2033
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation - Fires NavWar	1	2018	4	2033
Fires SoS APNT related AS and NavWar	1	2021	4	2033
Network Assisted Assured PNT and NavWar Phase 1	1	2025	4	2026
Network Assisted Assured PNT and NavWar Phase 2	1	2031	4	2032
Network Assisted Assured PNT and NavWar for MDO Phase 1	1	2029	4	2030
Network Assisted Assured PNT and NavWar for MDO Phase 2	1	2031	4	2032
Automation of NavWar MDO across Fires Systems-of-Systems	1	2033	4	2033
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation - Fires SoS	1	2022	4	2033

Note

Notes:

Positioning, Navigation and Timing (PNT)

Subject Matter Expert (SME)

Working Integrated Product Team (WIPT)

Network Assisted (NA)

Assured Positioning, Navigation and Timing (APNT)

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)											PE 0603645A / Armored System Modernization - Adv Dev		
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	-	154.010	135.122	43.026	-	43.026	23.188	23.177	23.404	23.665	0.000	425.592	
EV7: Combat Vehicle Prototyping	-	154.010	135.122	43.026	-	43.026	23.188	23.177	23.404	23.665	0.000	425.592	

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Next Generation Combat Vehicle (NGCV) Army Modernization Priority. Armored System Modernization Advanced Development provides maturation of emerging Science and Technology (S&T) and industry technologies for potential integration to ground combat vehicles. The purpose of this Program Element's (PE) funding is to demonstrate new capabilities to meet current and future military needs and to determine integration potential across the Army portfolio of ground combat vehicles by testing and evaluating a variety of technologies.

The total cost of the OMFV Middle Tier of Acquisition effort is \$1,348 million RDT&E from FY21 to FY24. The OMFV is fully funded across the Future Years Defense Program.

The total cost of the RCV(L) Middle Tier of Acquisition effort is \$508 million RDT&E from FY22 to FY27. The RCV(L) is fully funded across the Future Years Defense Program.

B. Program Change Summary (\$ in Millions)

Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	164.328	49.944	43.935	-	43.935
Current President's Budget	154.010	135.122	43.026	-	43.026
Total Adjustments	-10.318	85.178	-0.909	-	-0.909
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	85.200			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-10.318	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.909	-	-0.909
• FFRDC Transfer	-	-0.022	-	-	-

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: EV7: Combat Vehicle Prototyping

Congressional Add: Program Increase - Advanced Combat Engine

FY 2022	FY 2023
4.000	13.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored System Modernization - Adv Dev</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions) Congressional Add: <i>Program Increase - Abrams Modernization</i> Congressional Add: <i>Program Increase - Next Generation Auxiliary Power Unit</i>		FY 2022 FY 2023
		- 67.200
		- 5.000
	Congressional Add Subtotals for Project: EV7	4.000 85.200
	Congressional Add Totals for all Projects	4.000 85.200
Change Summary Explanation Decreased funding to support higher Army priorities.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev				Project (Number/Name) EV7 / Combat Vehicle Prototyping				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
EV7: Combat Vehicle Prototyping	-	154.010	135.122	43.026	-	43.026	23.188	23.177	23.404	23.665	0.000	425.592	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
Armored System Modernization Advanced Development will continue the maturation of emerging ground combat vehicle capabilities to provide a bridge from S&T investment to application on a vehicle platform, informing requirements through User Evaluations, identification of capability gaps and reduction of integration risks. Maturing emerging technologies like those in Project Convergence will enable ground combat platforms to meet the Army's strategy of fielding key Modernization efforts.													
The funding will support virtual and physical concept development, trade studies, technical and operational analyses to assess future concepts and designs. This would also include the support for survivability, lethality and other soldier defined system requirements. In addition, this funding will provide program management, expertise and a business process for the maturation and transition of emerging Science and Technology systems, system integration labs, technology demonstration efforts risk reduction, maturation, testing and assessment, and develop and integrate systems for Ground Combat Systems (GCS) platforms.													
The total cost of the OMFV Middle Tier of Acquisition effort is \$1,348 million RDT&E from FY21 to FY24. The OMFV is fully funded across the Future Years Defense Program.													
The total cost of the RCV(L) Middle Tier of Acquisition effort is \$508 million RDT&E from FY22 to FY27. The RCV(L) is fully funded across the Future Years Defense Program.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024
Title: Government Engineering & Program Management											8.097	6.226	5.762
Description: This effort will support Program Management Office (PMO) support that will cover the costs of government and direct support contractor labor, travel, training, supplies, equipment and facilities to manage the experimental prototyping projects.													
FY 2023 Plans: This funding will support Government oversight and project management of planned efforts which will cover government salaries, contractor labor, travel, training, supplies, equipment and facilities costs.													
FY 2024 Plans: This funding will support Government oversight and project management of planned efforts which will cover government salaries, contractor labor, travel, training, supplies, equipment and facilities costs.													
FY 2023 to FY 2024 Increase/Decrease Statement:													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 4	PE 0603645A / Armored System Modernization - Adv Dev	EV7 / Combat Vehicle Prototyping	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
The decrease is due to reduced project management oversight requirements.			
Title: Developmental Engineering		76.657	21.893
Description: Efforts will include the continued development and maturation of advanced technology concepts for ground combat vehicles and related support equipment.			9.977
FY 2023 Plans: This funding will further refine Advanced Combat Powertrain (ACP) maturation, which is comprised of the Advanced Combat Engine (ACE) and the Advanced Combat Transmission (ACT), to support production by FY24. A potential transition partner for this effort is the Optionally Manned Fighting Vehicle (OMFV), but could be applied to other combat vehicle platforms. Other Developmental Engineering efforts include but are not limited to 2nd Source High Voltage Power Controller, MUM-T, OMT, Combat Vehicle Light-weighting, Project Origin, Data Architecture Efforts and other combat vehicle technology advancement efforts. These advanced development efforts will support performance analysis, trade space analysis, capabilities assessments, and hardware demonstrations to support the emerging technologies to support the Army's Modernization Strategy.			
FY 2024 Plans: This funding will further refine Advanced Combat Powertrain (ACP) maturation, which is comprised of the Advanced Combat Engine (ACE) and the Advanced Combat Transmission (ACT), to support production by FY24. A potential transition partner for this effort is the Optionally Manned Fighting Vehicle (OMFV), but could be applied to other combat vehicle platforms. Other Developmental Engineering efforts include but are not limited to MUM-T Protected Comms, Advanced Combat Vehicle Concepts, Combat Vehicle Light-weighting, Combat Optimization for Robotic Systems, Autonomy, Integration, and Reliability (CORSAIR) (formerly named Project Origin), and other combat vehicle technology advancement efforts. These advanced development efforts will support performance analysis, trade space analysis, capabilities assessments, and hardware demonstrations to support the emerging technologies to support the Army's Modernization Strategy.			
FY 2023 to FY 2024 Increase/Decrease Statement: The decrease is due to completion of multiple projects in FY23 and the Advanced Combat Vehicle Concepts effort, Advanced Combat Powertrain, and other activities moving to prototype builds and test and evaluation in FY24.			
Title: Test & Evaluation		36.437	8.737
Description: Test and Evaluation (T&E) activities include contractor and government testing of prototype vehicles and technologies as well as user evaluations. Testing will be conducted using United States Army test facilities.			12.900
FY 2023 Plans: T&E efforts include but are not limited to: Project Origin soldier assessment efforts, Advanced Combat Powertrain Maturation, Combat Vehicle Light-weighting, High Voltage Power Controller, Tank Modernization, MUM-T, OMT, Aided Target Recognition			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping	
B. Accomplishments/Planned Programs (\$ in Millions) (AiTR), and other emerging combat vehicle technology advancements. To assist in determining future requirements while evaluating maturation level and aid in determination of bridging to S&T efforts above to vehicle platforms.			FY 2022
FY 2024 Plans: T&E efforts include but are not limited to: Combat Optimization for Robotic Systems, Autonomy, Integration, and Reliability (CORSAIR) (formerly named Project Origin) soldier assessment efforts, Advanced Combat Powertrain Maturation, Combat Vehicle Light-weighting, Tank Modernization, MUM-T Protected Comms, Aided Target Recognition (AiTR), and other emerging combat vehicle technology advancements. To assist in determining future requirements while evaluating maturation level and aid in determination of bridging S&T efforts to vehicle platforms.			FY 2023
FY 2023 to FY 2024 Increase/Decrease Statement: The increase is due to additional test activities for the Advanced Combat Vehicle Concepts efforts, Advanced Combat Powertrain, and other activities.			FY 2024
Title: Modeling & Simulation Description: Modeling and simulation efforts will allow for the ability to experiment with various technologies in a virtual environment. Support will include reviewing studies conducted and determining any significant issues, areas of concern or potential differences to aid in decision making. The results will provide the analytical underpinnings to support development of requirements.			0.260
FY 2023 Plans: This funding will support Optionally Manned Tank (OMT) and other Combat Vehicle efforts to analyze and assess technologies in a virtual environment to aide in decision making.			0.500
FY 2023 to FY 2024 Increase/Decrease Statement: The decrease is due to the completion of the Optionally Manned Tank (OMT) and other Combat Vehicle efforts in FY23.			-
Title: Experimental Prototyping Description: Experimental prototyping allows for maturation of emerging S&T and industry technologies to inform requirements, identify mitigations for capability gaps and reduce technology integration and program risks for emerging technologies. The funding will support prototyping for Advanced Combat Powertrain, Advanced Combat Vehicle Concepts and Studies, Advanced Lightweight Track, Combat Optimization for Robotic Systems, Autonomy, Integration, and Reliability (CORSAIR) (formerly named Project Origin) soldier assessment efforts and Other Technology Advancements.			28.559
FY 2023 Plans:			10.744
			14.387

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>This funding will support prototype design, builds, validation/verification, and maintenance for MUM-T, OMT, Project Origin Soldier Operational Experiment (SOE) Campaign, 2nd Source High Voltage Power Controller and Other Technology Advancement efforts.</p> <p>FY 2024 Plans: This funding will support prototype design, builds, validation/verification, and maintenance for MUM-T Protected Comms, Combat Optimization for Robotic Systems, Autonomy, Integration, and Reliability (CORSAIR) Soldier Operational Experiment (SOE) (formerly named Project Origin), and Other Technology Advancement efforts.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase is due to Advanced Combat Vehicle Concepts and MUM-T Protected Comms prototype builds addressing engineering refinements.</p>				
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC 638.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638.</p>				- 1.822 -
Accomplishments/Planned Programs Subtotals				150.010 49.922 43.026
<p>Congressional Add: Program Increase - Advanced Combat Engine</p> <p>FY 2022 Accomplishments: This effort improves engine subsystem designs, optimizes performance, and funds engine units for vehicle demonstration.</p> <p>FY 2023 Plans: This effort improves engine subsystem designs, optimizes performance, and funds engine units for vehicle demonstration.</p> <p>Congressional Add: Program Increase - Abrams Modernization</p>		FY 2022	FY 2023	
		4.000	13.000	
		-	67.200	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping	
		FY 2022	FY 2023
FY 2023 Plans: The Congressional Add reflects an increase for Abrams Modernization efforts to include, but not limited to: Unmanned Turret, Autoloader and Automated Ammunition Handling System, Hydro-Pneumatic suspension, Integration APS, and Hybrid Electric Drive.			
Congressional Add: Program Increase - Next Generation Auxiliary Power Unit		-	5.000
FY 2023 Plans: The Congressional Add of \$5M reflects an increase to evaluate integration of Hydro-Pneumatic Suspension Units onto the Abrams chassis.			
	Congressional Adds Subtotals	4.000	85.200

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks**D. Acquisition Strategy**

These level of efforts provide the focused investment for the development and demonstration of technology and prototyping for future combat vehicles in the battlefield. The intent of this funding is to mature the next generation of technology which will enable demonstration of capabilities developed in the S&T portfolio to meet emerging military needs across the current Army portfolio of ground vehicles.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev				Project (Number/Name) EV7 / Combat Vehicle Prototyping							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		1.822	Apr 2023	-		-		-	0.000	1.822	-
Subtotal				1.822		-		-		-		-	0.000	1.822	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimental Prototyping	Various	Various / QinetiQ North America / GVS / DCS / Picatinny Arsenal / Aberdeen Proving Grounds : Various	31.508	28.559	Jun 2022	10.744	Jun 2023	14.387	Jun 2024	-		14.387	Continuing	Continuing	Continuing
Developmental Engineering	Various	Cummins Power Generation and GVSC : Various	-	76.657	Jun 2022	21.893		9.977	Jan 2024	-		9.977	0.000	108.527	-
Program Increase - Advanced Combat Engine	Various	Cummins Power Generation : Various	-	4.000	Jun 2022	13.000	Apr 2023	-		-		-	0.000	17.000	-
Program Increase - Next Generation Auxiliary Power Unit	Various	Various : Various	-	-		5.000	Apr 2023	-		-		-	0.000	5.000	-
Program Increase - Abrams Modernization	TBD	General Dynamics / GVSC : TBD	-	-		67.200	Jun 2023	-		-		-	0.000	67.200	-
Subtotal				31.508	109.216		117.837		24.364		-	24.364	Continuing	Continuing	N/A

Remarks

Program decrease experimental prototyping costs by \$15,464K in FY21.
 Congressional add \$8,200K for Next Generation Electrified Transmission in FY21.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev				Project (Number/Name) EV7 / Combat Vehicle Prototyping								
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management	Various	PM/Program Executive Office/GVSC : Warren, MI	55.860	8.097	Jan 2022	6.226	Jan 2023	5.762	Jan 2024	-		5.762	Continuing	Continuing	Continuing	
		Subtotal	55.860	8.097		6.226		5.762		-		5.762	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Modeling & Simulation	MIPR	Various : Various	15.509	0.260		0.500		-		-		-	Continuing	Continuing	Continuing	
Test & Evaluation	MIPR	National Advanced Mobility Consortium (NAMC) / GVSC / Various : Various	22.752	36.437		8.737		12.900		-		12.900	Continuing	Continuing	-	
		Subtotal	38.261	36.697		9.237		12.900		-		12.900	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				125.629	154.010		135.122		43.026		-		43.026	Continuing	Continuing	N/A
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603645A / Armored System Modernization - Adv Dev				EV7 / Combat Vehicle Prototyping									

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603645A / Armored System Modernization - Adv Dev				EV7 / Combat Vehicle Prototyping									
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SPHS Lightweighting Prototype Development																	
					SPHS Lightweighting Prototype Development												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

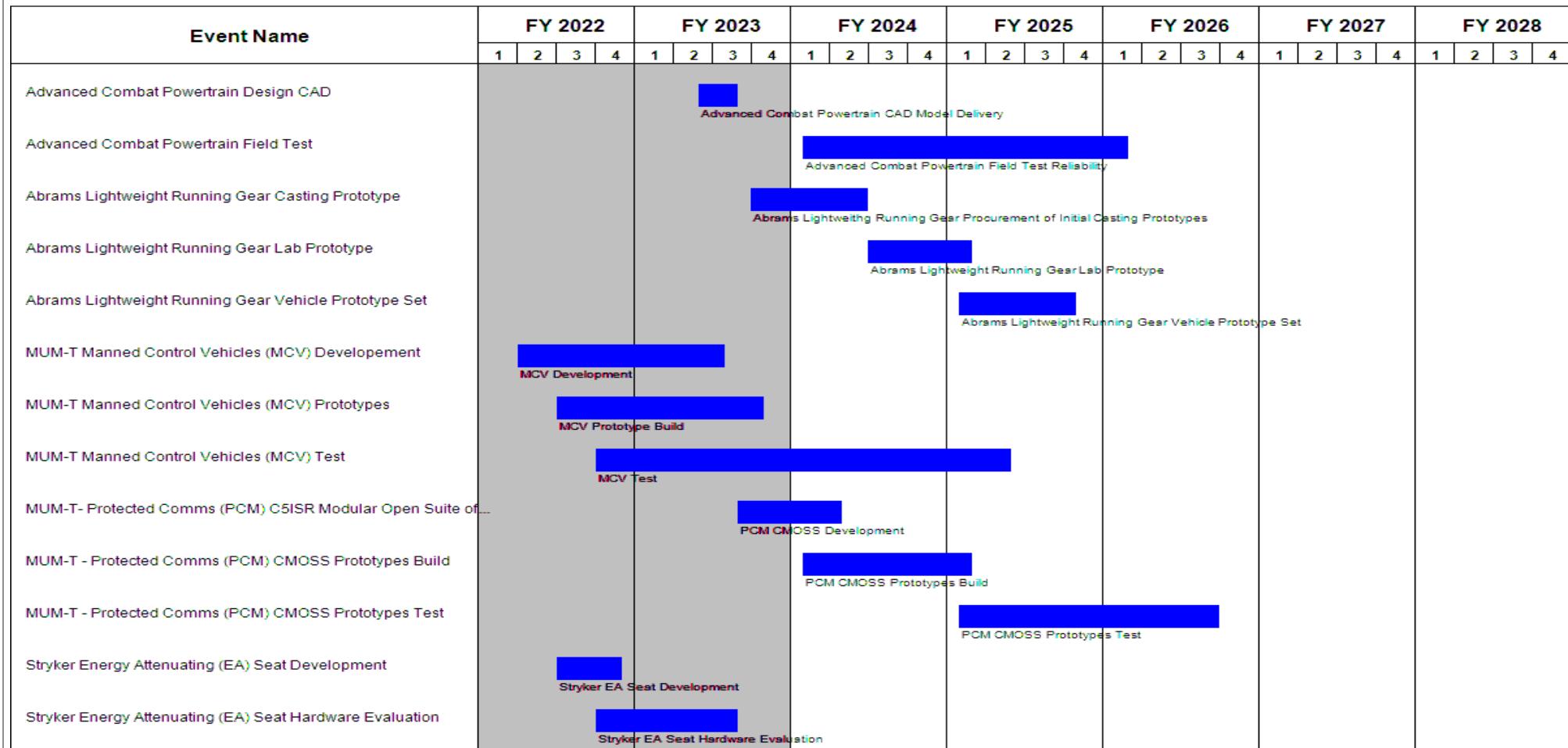
2040 / 4

R-1 Program Element (Number/Name)

PE 0603645A / Armored System Modernization - Adv Dev

Project (Number/Name)

EV7 / Combat Vehicle Prototyping



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603645A / Armored System Modernization - Adv Dev				EV7 / Combat Vehicle Prototyping									
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Stryker Energy Attenuating (EA) Seat Transition Decision																	
AMERCA-M Prototype Build																	
AMERCA-M Design																	
AMERCA-M Track and Suspension CDR																	
AMERCA-M Powertrain CDR																	
AMERCA-M Build Complete																	
AMERCA-M Dynamometer Testing																	
AMERCA-M Test Site T&E																	
Tank Modernization Design																	
Tank Modernization Build																	
Tank Modernization Test																	
Soft Kill System Advancements - Countermeasure Development																	
Soft Kill System Advancements - Countermeasure Prototype...																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

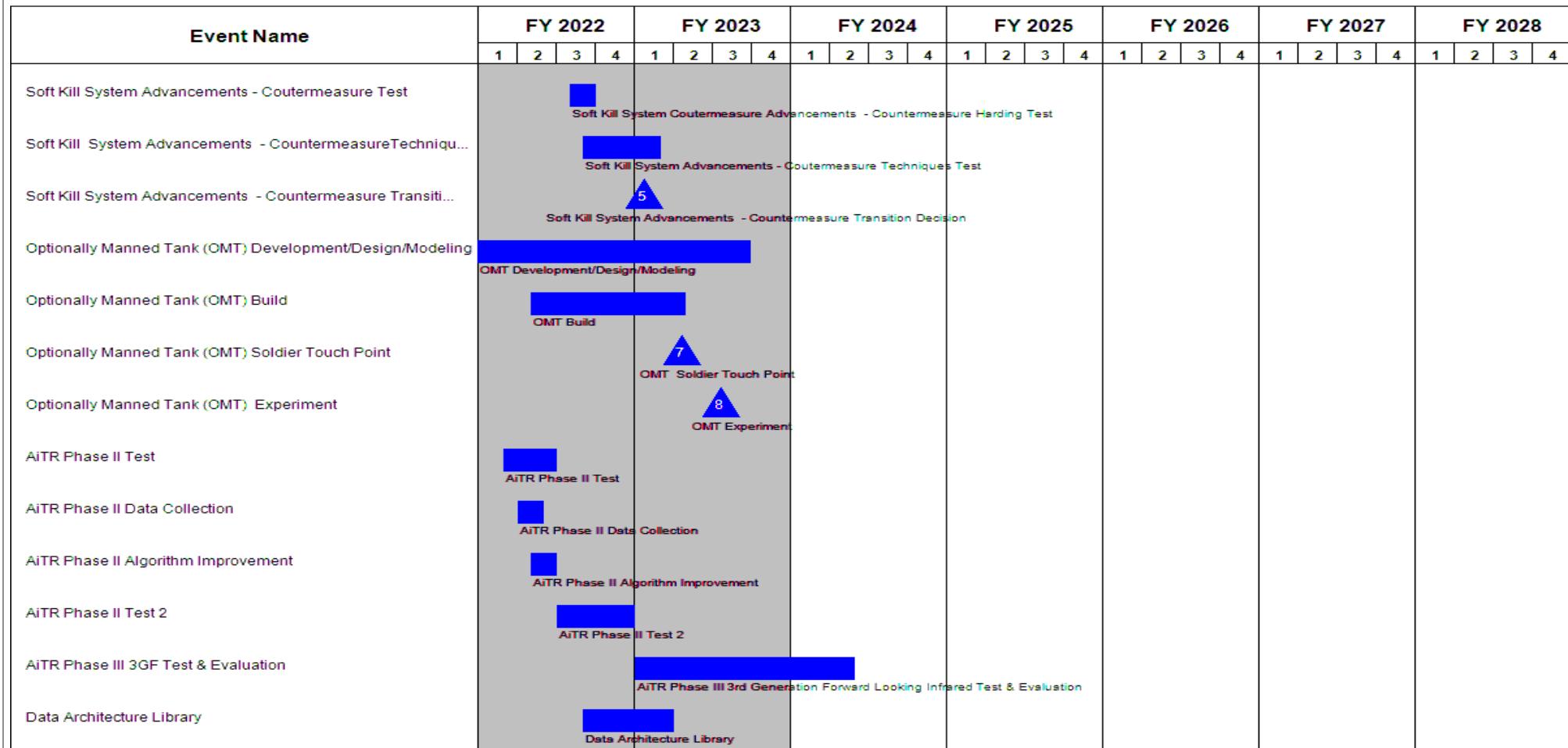
2040 / 4

R-1 Program Element (Number/Name)

PE 0603645A / Armored System Modernization - Adv Dev

Project (Number/Name)

EV7 / Combat Vehicle Prototyping



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023															
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev				Project (Number/Name) EV7 / Combat Vehicle Prototyping																					
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Data Architecture Model																													
CORSAIR Soldier Experiments																													
Congressional ADD Abrams Modernization																													
Congressional ADD Auxiliary Power Unit																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MET-D Phase 2 Build	1	2021	2	2021
MET-D Phase 2 Testing	4	2021	3	2022
MET-D Phase 2 Soldier Operational Evaluation (SOE)	4	2022	4	2022
MET-D Phase 2 Project Finish	1	2023	1	2023
XM913 Weapon Improvements and TDP Development	1	2021	3	2023
XM913 Subscale Muzzle Brake Erosion Test (30mm)	2	2022	3	2022
XM913 Environmental Testing	1	2023	3	2023
Bradley Hybrid Electric Vehicle (BHEV) Development	3	2020	3	2022
Bradley Hybrid Electric Vehicle Prototype Build/Integration	4	2021	4	2022
Bradley Hybrid Electric Vehicle ATC Test	4	2022	2	2023
Bradley Hybrid Electric Vehicle Transition Decision	2	2023	2	2023
Advanced Combat Vehicle Concepts and Studies	2	2021	3	2023
Advanced Lightweight Track (ALwT) Development	4	2021	1	2023
Advanced Lightweight Track (ALwT) Validation Testing	2	2023	4	2023
SPHS Lightweighting Prototype Development	2	2022	2	2023
SPHS Lightweighting Testing	3	2022	3	2023
High Voltage Power Controller (HVPC) Prototype	2	2021	3	2022
High Voltage Power Controller (HVPC) Testing	3	2022	3	2023
High Voltage Power Controller (HVPC) 2nd Source Development	1	2023	4	2023
High Voltage Power Controller 2nd Source Prototype Build	2	2023	3	2023
High Voltage Power Controller 2nd Source Test	3	2023	4	2023
High Voltage Power Controller 2nd Source Transition Decision	4	2024	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping		
Events	Start		End	
	Quarter	Year	Quarter	Year
Advanced Combat Powertrain Production Design Mechanical Verification	1	2021	1	2024
Advanced Combat Powertrain Refinement	1	2024	1	2026
Advanced Combat Powertrain Design Refinement Build	2	2022	4	2022
Advanced Combat Powertrain Field Test Support and FACAR Review	3	2022	4	2022
Advanced Combat Powertrain Design Validation Plan	4	2022	2	2023
Advanced Combat Powertrain Design CAD	2	2023	3	2023
Advanced Combat Powertrain Field Test	1	2024	1	2026
Abrams Lightweight Running Gear Casting Prototype	4	2023	2	2024
Abrams Lightweight Running Gear Lab Prototype	3	2024	1	2025
Abrams Lightweight Running Gear Vehicle Prototype Set	1	2025	4	2025
MUM-T Manned Control Vehicles (MCV) Developement	2	2022	3	2023
MUM-T Manned Control Vehicles (MCV) Prototypes	3	2022	4	2023
MUM-T Manned Control Vehicles (MCV) Test	4	2022	2	2025
MUM-T- Protected Comms (PCM) C5ISR Modular Open Suite of Standards (CMOSS) Dev	3	2023	2	2024
MUM-T - Protected Comms (PCM) CMOSS Prototypes Build	1	2024	1	2025
MUM-T - Protected Comms (PCM) CMOSS Prototypes Test	1	2025	3	2026
Stryker Energy Attenuating (EA) Seat Development	3	2022	4	2022
Stryker Energy Attenuating (EA) Seat Hardware Evaluation	4	2022	3	2023
Stryker Energy Attenuating (EA) Seat Transition Decision	1	2024	1	2024
AMERCA-M Prototype Build	4	2022	1	2023
AMERCA-M Design	3	2022	1	2023
AMERCA-M Track and Suspension CDR	3	2022	3	2022
AMERCA-M Powertrain CDR	3	2022	3	2022
AMERCA-M Build Complete	4	2023	4	2023
AMERCA-M Dynamometer Testing	1	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping		
Events	Start		End	
	Quarter	Year	Quarter	Year
AMERCA-M Test Site T&E	3	2023	4	2023
Tank Modernization Design	1	2021	2	2022
Tank Modernization Build	2	2022	4	2022
Tank Modernization Test	1	2023	4	2024
Soft Kill System Advancements - Countermeasure Development	4	2022	1	2023
Soft Kill System Advancements - Countermeasure Prototype Build	4	2021	2	2022
Soft Kill System Advancements - Countermeasure Test	3	2022	3	2022
Soft Kill System Advancements - Countermeasure Techniques Test	3	2022	1	2023
Soft Kill System Advancements - Countermeasure Transition Decision	1	2023	1	2023
Optionally Manned Tank (OMT) Development/Design/Modeling	4	2021	3	2023
Optionally Manned Tank (OMT) Build	2	2022	2	2023
Optionally Manned Tank (OMT) Soldier Touch Point	2	2023	2	2023
Optionally Manned Tank (OMT) Experiment	3	2023	3	2023
AiTR Phase II SW & Algorithm Improvements	4	2020	2	2021
AiTR Phase II Test	1	2021	2	2022
AiTR Phase II Data Collection	2	2022	2	2022
AiTR Phase II Algorithm Improvement	2	2022	2	2022
AiTR Phase II Test 2	3	2022	4	2022
AiTR Phase III 3GF Test & Evaluation	1	2023	2	2024
Data Architecture Library	3	2022	1	2023
Data Architecture Model	4	2022	1	2023
CORSAIR Soldier Experiments	3	2022	4	2024
Congressional ADD Abrams Modernization	3	2023	4	2024
Congressional ADD Auxiliary Power Unit	3	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603747A / Soldier Support and Survivability								
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	-	2.791	4.060	3.550	-	3.550	4.154	4.160	4.204	4.251	0.000	27.170	
610: Food Adv Development	-	2.791	4.060	3.550	-	3.550	4.154	4.160	4.204	4.251	0.000	27.170	
A. Mission Description and Budget Item Justification													
This Program Element (PE) supports component development and prototyping for organizational equipment, improved individual clothing and equipment that enhance Soldier battlefield effectiveness, survivability, and sustainment. This PE also supports the component development and prototyping of joint service food and combat feeding equipment designed to reduce logistics burden.													
B. Program Change Summary (\$ in Millions)					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total				
Previous President's Budget					2.897	4.060	3.625	-	-				3.625
Current President's Budget					2.791	4.060	3.550	-	-				3.550
Total Adjustments					-0.106	0.000	-0.075	-	-				-0.075
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-				
					-0.106	-	-	-	-				-0.075
Change Summary Explanation													
Decreased funding to support higher Army priorities.													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603747A / Soldier Support and Survivability				610 / Food Adv Development				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
610: Food Adv Development	-	2.791	4.060	3.550	-	3.550	4.154	4.160	4.204	4.251	0.000	27.170	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	
A. Mission Description and Budget Item Justification													
This Project provides for the advanced component development and prototyping of Joint Service combat ration components/platforms and field feeding equipment designed to improve warfighter performance and reduce the logistics burden of subsistence support. Efforts funded in this Project support all four Services, the Special Operations Command, and the Defense Logistics Agency. The Army serves as the Executive Agent for this Department of Defense (DoD) program, with oversight and coordination provided by the DoD Combat Feeding Research and Engineering Board as required by DoD Directive (DoDD) 3235.02E. Centralized execution of the DoD Combat Feeding Research and Engineering Program (CFREP) with Joint Service review and approval eliminates unnecessary duplication of efforts across the Services and maximizes use of common materiel solutions. Prototypes validated within this effort transition to 0604713A/Project 548 for System Development and Demonstration.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Joint Service Combat Ration Advanced Development Description: This effort matures and integrates combat ration technologies and prototypes that enable warfighter maneuver, readiness and effectiveness during highly mobile, dispersed operations. Technologies are transitioned from RDTE Budget Activity 3 projects to provide individual and group combat rations and components with improved capabilities including improved warfighter physical and cognitive performance through optimized nutrition and a reduced logistics burden through weight and cube reduction. FY 2023 Plans: Validate and integrate S&T ration packaging material innovations to enhance ration heating efficiency during heating and sterilization processing methods; validate and integrate calorically dense, low weight and volume products into existing ration platforms to increase operational effectiveness; Conduct T&E of technologies for integration into the next generation of CCAR. Conduct T&E of packaging prototypes and nutritionally optimized products to enable safe feeding capabilities in hazardous environments. Transition validated prototypes to APE 0604713A/Project 548 for operational testing and evaluation (OT&E). FY 2024 Plans: Will perform advanced component development of calorically dense meal replacement bars, for insertion into the Meal Ready-to-Eat (MRE) and Close Combat Assault Ration (CCAR) platforms, in support of operations where resupply is limited; will perform small scale producibility studies and quality assurance testing of emerging manufacturing processes; Will perform evaluations of packaging configurations in support of reduced field feeding logistics, and supporting waste reduction efforts in operational											FY 2022 FY 2023 FY 2024		
											1.507	2.176	2.661

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / Soldier Support and Survivability	Project (Number/Name) 610 / Food Adv Development		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
settings; will maintain menu modernization enhancements across operational ration platform, to support the current demographic shifts, meeting emerging Warfighter preferences, improving Warfighter acceptance, and increasing nutritional intake.				
FY 2023 to FY 2024 Increase/Decrease Statement: Increase to support changes to validate and integrate ration packaging material innovations into Joint Services combat rations.				
Title: Joint Service Field Feeding Equipment and Menu Development Description: This effort matures and integrates field feeding equipment technologies and prototypes in support of the Navy, Air Force, and Marine Corps that reduce the logistics burden, improve efficiency, and decrease operation and support costs as directed by the DoD CFREB. This effort also conducts test and evaluation (T&E) on Navy Standard Core Menu components and preparation techniques to enhance efficiency through standardization across the fleet and reduce labor requirements.				1.284
FY 2023 Plans: Conduct T&E of USAF Basic Expeditionary Airfield Resources (BEAR) field kitchens to evaluate water and power requirements; conduct T&E of wing wall kits and refrigeration prototypes for Expeditionary Field Kitchens (EFKs) for use by deployed units in austere environments; conduct T&E of multi-capability food service equipment prototypes for USAF Joint Air-Containerized Kitchen Systems (JACKS) to reduce power and maintenance resources/costs; continue to conduct T&E of bakery products and preparation techniques to enhance menu acceptance and reduce labor requirements; and transition prototypes to APE 0604713A/Project 548 for OT&E.				1.854
FY 2024 Plans: Will conduct developmental T&E for insertion of refrigeration system prototypes in support of USAF Basic Expeditionary Airfield Resources (BEAR) energy conservation goals, will transition prototypes to Program Element 0604713A/Project 548 - Combat Feeding, Clothing and Equipment, for Operational Test & Evaluation (OT&E); Will facilitate transition of Contingency Menus developed under the Navy Standard Core Menu (NSCM) to the Navy and support galley-based Limited User Evaluations.				0.889
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to planned lifecycle transition of efforts to APE 0604713A/Project 548 for OT&E.				
Title: SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC §638.				- 0.030 -
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638.				
FY 2023 to FY 2024 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603747A / Soldier Support and Survivability				Project (Number/Name) 610 / Food Adv Development				
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC §638.								FY 2022	FY 2023	FY 2024		
						Accomplishments/Planned Programs Subtotals		2.791	4.060	3.550		
C. Other Program Funding Summary (\$ in Millions)												
Line Item		FY 2022	FY 2023	FY 2024	Base	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
• 548: Mil Subsistence Sys		1.598	1.566	2.223	-	2.223	1.620	1.622	1.639	1.658	0.000	11.926
Remarks												
D. Acquisition Strategy Validated prototypes will transition to System Development and Demonstration for operational test and evaluation.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603747A / Soldier Support and Survivability				Project (Number/Name) 610 / Food Adv Development								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Combat Feeding Program Management	Allot	CCDC Soldier Center, Natick, MA : Natick, MA	8.098	0.333	Oct 2021	0.466	Oct 2022	0.495	Oct 2023	-		0.495	Continuing	Continuing	Continuing	
Subtotal			8.098	0.333		0.466		0.495		-		0.495	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Joint Service Rations and Combat Feeding Equipment	Various	Various : Various	44.264	2.167	Oct 2021	3.186	Oct 2022	2.442	Oct 2023	-		2.442	Continuing	Continuing	Continuing	
Subtotal			44.264	2.167		3.186		2.442		-		2.442	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Joint Service Rations and Combat Feeding Equipment	Allot	CCDC Soldier Center, Natick, MA : Natick, MA	1.571	0.291	Oct 2021	0.408	Oct 2022	0.613	Oct 2023	-		0.613	Continuing	Continuing	Continuing	
Subtotal			1.571	0.291		0.408		0.613		-		0.613	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			53.933	2.791		4.060		3.550		-		3.550	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023														
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603747A / Soldier Support and Survivability							Project (Number/Name) 610 / Food Adv Development																	
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Evaluate individual and group ration enhancements and tr...																												
Conduct in-house T&E of OPRATS with improved lipid qual...																												
Conduct in-house T&E of EGR and transition to SDD for OT&E																												
Conduct I-H T&E of non-destructive sampling technologie...																												
Conduct in-house T&E of optimized CCAR and transition to...																												
Provide USN w/CPI, evaluations and menu development to s...																												
Conduct in-house T&E of energy conservation technologies...																												
Conduct in-house T&E of EFK upgrades for USMC																												
Conduct T&E of food service equipment systems for USAF JACKS																												
Conduct DT&E of field feeding equipment for Navy Bakery ...																												
Conduct in-house T&E of Modular Operational Ration Enhanc...																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / Soldier Support and Survivability	Project (Number/Name) 610 / Food Adv Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Evaluate individual and group ration enhancements and transition to SDD for OT&E	1	2017	4	2028
Conduct in-house T&E of OPRATS with improved lipid quality & transition to TDPs	1	2022	4	2022
Conduct in-house T&E of EGR and transition to SDD for OT&E	1	2020	4	2022
Conduct I-H T&E of non-destructive sampling technologies for food contamination	1	2021	4	2022
Conduct in-house T&E of optimized CCAR and transition to SDD for OT&E	1	2024	4	2026
Provide USN w/CPI, evaluations and menu development to support NSCM upgrades	1	2017	4	2028
ID and evaluate advanced galley/scullery equipment for the USN	1	2017	4	2021
Conduct T&E of Galley/Scullery equipment and transition to SDD for OT&E	1	2017	4	2021
Conduct in-house T&E of JIMKE intuitive equipment and transition to SDD for OT&E	2	2019	4	2020
Conduct T&E on rapidly deployable refrigeration prototype	1	2020	4	2020
Conduct in-house T&E of mobile feeding galley and transition to SDD for OT&E	1	2019	1	2020
Award contract to fabricate IRefS prototype and conduct in-house T&E	1	2019	4	2020
Conduct in-house T&E of energy conservation technologies for BEAR Kitchens	1	2023	4	2024
Conduct in-house T&E of EFK upgrades for USMC	1	2022	4	2024
Conduct in-house T&E of expeditionary kitchen systems for shore-based Navy units	1	2020	4	2021
Conduct T&E of food service equipment systems for USAF JACKS	1	2023	4	2023
Conduct DT&E of field feeding equipment for Navy Bakery Upgrades, Transition for OT&E	1	2023	4	2023
Conduct in-house T&E of Modular Operational Ration Enhancement, Transition for OT&E	1	2025	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603766A / Tactical Electronic Surveillance System - Adv Dev							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	113.365	72.314	65.567	-	65.567	38.537	29.007	29.019	39.343	Continuing	Continuing
907: <i>Tactical Exploitation Of National Capabilities</i>	-	18.264	14.108	17.719	-	17.719	17.891	9.583	9.320	19.423	Continuing	Continuing
BX9: <i>Tactical Intel Targeting Access Node Adv Develop</i>	-	20.003	22.767	20.872	-	20.872	18.274	17.457	17.643	17.841	Continuing	Continuing
CC5: <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>	-	75.098	35.439	26.976	-	26.976	2.372	1.967	2.056	2.079	Continuing	Continuing

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

Tactical Exploitation of National Capabilities (TENCAP) exploits national capabilities to pace evolving threats in support of operations during conflict and competition. TENCAP systems and technologies provide deep sensing to support commanders' situational understanding (patterns of life, threat intentions, etc.), indications & warnings (detection of enemy mobilization and hostile activity), and intelligence support to targeting (order of battle, electronic target folders, target detection, Battle Damage Assessment, etc.). TENCAP systems and technologies support Theater-level fires and effects. TENCAP systems enable integrated Signals Intelligence (SIGINT) / Geospatial Intelligence (GEOINT) / Electronic Warfare (EW) / and Cyberspace operations. TENCAP supports Army modernization priorities including Long Range Precision Fires, Assured Position Navigation and Timing/Space (PNT/S), Future Vertical Lift (FVL), and Air Missile Defense (AMD). In summary, TENCAP is a key enabler to defeating peer competitor Anti-Access / Area-Denial (A2/AD) strategies.

Tactical Exploitation of National Capabilities (TENCAP) accomplishes the Army's Tactical Electronic Surveillance System Advance Development by leveraging National Intelligence Community (IC) capabilities through cross-agency engineering to evaluate, enhance, prototype, and transition Intelligence, Surveillance and Reconnaissance (ISR) technologies/capabilities from the IC into Army systems and architectures. This Program Element includes three projects:

- 1) TENCAP Core project (907).
- 2) Tactical Intelligence Targeting Access Node (TITAN) (space) Pre-Prototype development project (BX9).
- 3) Low Earth Orbit ISR (LEO ISR) development project (CC5).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603766A / Tactical Electronic Surveillance System - Adv Dev			
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO
Previous President's Budget		113.365	72.314	64.799	-
Current President's Budget		113.365	72.314	65.567	-
Total Adjustments		0.000	0.000	0.768	-
• Congressional General Reductions		-	-		
• Congressional Directed Reductions		-	-		
• Congressional Rescissions		-	-		
• Congressional Adds		-	-		
• Congressional Directed Transfers		-	-		
• Reprogrammings		-	-		
• SBIR/STTR Transfer		-	-		
• Adjustments to Budget Years		-	-	0.768	-
Change Summary Explanation					
Increased funding due to revised economic assumptions.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				907 / <i>Tactical Exploitation Of National Capabilities</i>				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
907: <i>Tactical Exploitation Of National Capabilities</i>	-	18.264	14.108	17.719	-	17.719	17.891	9.583	9.320	19.423	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

TENCAP exploits national capabilities to pace evolving threats in support of operations during conflict and competition. TENCAP systems and technologies provide deep sensing to support commanders' situational understanding (patterns of life, threat intentions, etc.), indications & warnings (detection of enemy mobilization and hostile activity), and intelligence support to targeting (order of battle, electronic target folders, target detection, Battle Damage Assessment, etc.). TENCAP systems and technologies support Theater-level fires and effects, TENCAP systems enable integrated Signals Intelligence (SIGINT) / Electronic Warfare (EW) / and Cyberspace operations. TENCAP supports Army modernization priorities including Long Range Precision Fires, Assured Position Navigation and Timing/Space (APNT/S), and Future Vertical Lift (FVL). In summary, TENCAP is a key enabler to defeating peer competitor Anti-Access / Area-Denial (A2/AD) strategies.

The Tactical Exploitation of National Capabilities (TENCAP) office serves as the Army's centralized lead to perform National Intelligence cross-agency engineering to evaluate, enhance, prototype, and transition Intelligence, Surveillance and Reconnaissance (ISR) technologies/capabilities from the National Intelligence Community (IC) into Army systems and architectures.

TENCAP programs perform two vital functions for the Army's Warfighters: (1) ensures assured access to current and future National and Commercial sensors and supporting tactical architectures; and (2) exploits and influences new developments that focus on improving the Analysis and Tasking, Collection, Processing, Exploitation, Dissemination (TCPED) of intelligence data.

FY2024 Base funding in the amount of \$17.719 million enables systems engineering and collaborative development and prototyping on multiple National Intelligence Community (IC) advanced software and prototype developments that leverage upcoming National IC investments for Army use. This collaborative environment ensures continuous Army interoperability with National IC assets and architectures, exploits advances in commercial imagery and signal technologies, and develops prototypes that directly support the Army Warfighter. In FY24, TENCAP will begin integrating Space Force's new Space-Based ISR into the Tactical Intelligence Targeting Access Node (TITAN) Program of Record.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: TENCAP Cross-agency Core Engineering activities

Description: Funds cross-agency core engineering activities using organic and matrix engineering subject matter experts (SMEs). By utilizing these SMEs, TENCAP is able to collaborate, develop and exploit emerging multi-intelligence based

	FY 2022	FY 2023	FY 2024
	14.729	10.528	11.862

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 4	PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	907 / <i>Tactical Exploitation Of National Capabilities</i>	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
technologies to satisfy/accelerate Army Intelligence, Surveillance, Reconnaissance (ISR), Mission Command and Force Protection requirements.			
FY 2023 Plans: Continue the Core Army TENCAP Mission, to work with and incorporate Army requirements into the earliest, most cost-effective stages of National developments; ensure Army continued access to sensors and multi-intelligence based capabilities; monitor National Agencies' emerging technologies and systems; exploit advances in commercial imagery and signal technologies; develop prototypes that directly support Army Warfighters.			
FY 2024 Plans: Incorporate Army requirements into the earliest, most cost-effective stages of National developments; prototype capabilities to ensure Army access to sensors and multi-intelligence based capabilities; monitor National Agencies' emerging technologies and systems; exploit advances in national and commercial overhead capabilities.			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$1.334 million addresses significant changes to the National and Commercial overhead constellations with increased analysis and prototyping to ensure Army access to these capabilities.			
Title: Air Vigilance - Advanced Development Description: Enhanced intelligence, force protection, and indications and warning capabilities under Army TENCAP program to pace the proliferation and rapid advances in threat and technology.	2.500	2.500	4.768
FY 2023 Plans: Continue to develop enhanced intelligence, force protection, and indications and warning capabilities under Army TENCAP program, to pace the proliferation and rapid advances in threat and technology.			
FY 2024 Plans: Exploit National investments and advances in Signal Intelligence (SIGINT) to ensure the Army's ability to identify and counter the rapidly evolving threat. Integrate advanced signals software into other Army prototype systems.			
FY 2023 to FY 2024 Increase/Decrease Statement: FY2024 funds increased by \$2.268M to integrate advanced signals software into other Army prototype systems.			
Title: TENCAP Radio Frequency Exploitation (TRFE) Description: Prototype capability software that informs, influences and enhances Multi-Discipline sensor systems within PEO IEW&S such as Air Vigilance (AV), and Terrestrial Layer System (TLS) to pace the threat by targeting modern digital communications systems employed by near-peer nation state armies. Assists with Joint All-Domain Operations Radio Frequency	1.035	1.080	1.089

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>								
B. Accomplishments/Planned Programs (\$ in Millions) (RF) Characterization for modern communication environments with the intent to synchronize Signal Intelligence (SIGINT), Electronic Warfare, and Cyber operations. Utilizes commercial industry components and architectures to minimize hardware costs, risk and maximizes scalability/modularity.									FY 2022	FY 2023	FY 2024					
FY 2023 Plans: Collaborate and exploit specific National investments and advances in Signal Intelligence (SIGINT), Electronic Warfare and Cyber capabilities for use and advancement of Army Warfighter capabilities.																
FY 2024 Plans: FY24 funds will leverage National investments and advances in Signal Intelligence (SIGINT), Electronic Warfare and Cyber capabilities for use and advancement of Army Warfighter capabilities in a variety of form factors and pace the threat.																
FY 2023 to FY 2024 Increase/Decrease Statement: FY2024 level of effort anticipated to remain stable. Minor adjustment due to changing economic assumptions.									Accomplishments/Planned Programs Subtotals	18.264	14.108	17.719				
C. Other Program Funding Summary (\$ in Millions)																
Line Item		FY 2022	FY 2023	FY 2024	FY 2024	FY 2024					Cost To Complete					
• 0605766A: <i>National Capabilities Integration (MIP)</i>		13.454	17.030	15.129	Base	OCO	Total	FY 2025	FY 2026	FY 2027	FY 2028					
• OMA - 122021: <i>Contractor Logistics Support and Other Weapon Support</i>		11.360	11.401	11.640	-	-	15.129	16.953	17.358	17.542	17.738					
											0.000					
											115.204					
Remarks A portion of FY24 Base OMA funding (\$2.426 million) provides support for the CORE TENCAP program. The larger portion of the FY24 Base OMA funding (\$9.214 million) funds sustainment of deployed CORIAN Counter UAS systems.																
D. Acquisition Strategy The Army Tactical Exploitation of National Capabilities (TENCAP) Core mission is Congressionally mandated. The Secretary of the Army chartered this organization to leverage National Intelligence Community (IC) capabilities for use by the tactical Army. TENCAP subject matter experts, in conjunction with Intelligence Community partners, conduct engineering, prototyping, testing and demonstrations of the Army's ability to receive and exploit next-generation National and commercial space-based intelligence, surveillance and reconnaissance (ISR) data through Army Intelligence collection systems.																

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>
End state: This is an ongoing requirement to ensure that the Army's ability to exploit National and Commercial space-based ISR, to close the deep-sensing gap in Multi-Domain operations, and to enable rapid targeting of threats.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TENCAP Intelligence Engineers (SETA)	C/CPFF	TBD : Alexandria, VA	30.346	1.500	Jan 2022	1.500	Jan 2023	1.500	Feb 2024	-		1.500	0.000	34.846	Continuing
TENCAP Intelligence Engineers(Matrix Gov)	MIPR	Army Geospatial Cener (AGC) : Alexandria, VA	12.057	1.500	Oct 2022	1.300	Oct 2022	1.600	Jan 2024	-		1.600	0.000	16.457	-
Subtotal		42.403	3.000		2.800		3.100		-		3.100	0.000	51.303	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TENCAP core mission activities	Various	Multiple : Multiple	33.552	8.129	Feb 2022	5.494	Feb 2023	2.616	Jan 2024	-		2.616	0.000	49.791	Continuing
Air Vigilance advanced software development	MIPR	Classified : MIPR	24.251	2.500	Jan 2021	1.800	Jan 2023	4.768	Feb 2024	-		4.768	0.000	33.319	Continuing
TENCAP Engineering (Contractor)	C/TBD	TBD : TBD	-	-		-		2.500	Feb 2024	-		2.500	0.000	2.500	-
TENCAP Radio Frequency Exploitation (TRFE)	MIPR	Classified : Classified	10.146	1.035	Jan 2022	0.850	Jan 2023	1.089	Feb 2024	-		1.089	0.000	13.120	-
Space Datalink	FFRDC	MITRE : Boston, MA	-	-		-		0.125		-		0.125	0.000	0.125	-
Subtotal		67.949	11.664		8.144		11.098		-		11.098	0.000	98.855	N/A	
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TENCAP Prgm Mgmt-Dir Gov,travel,etc.	Allot	Army TENCAP : Multiple Locations	22.200	2.500	Jan 2022	1.739	Oct 2022	1.707	Jan 2024	-		1.707	0.000	28.146	Continuing
TENCAP Secured Facilities and IT support	MIPR	Army Geospatial Center (AGC) : Alexandria, VA	4.602	0.700	Jan 2022	1.025	Nov 2022	1.210	Feb 2024	-		1.210	0.000	7.537	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>							
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
			Subtotal	26.802	3.200		2.764		2.917		-	2.917	0.000	35.683	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TENCAP Lab Tests, Exercises, Simulations	MIPR	Multiple : Multiple	3.031	0.400	Jan 2022	0.400	Jan 2023	0.604	Dec 2023	-		0.604	0.000	4.435	Continuing
			Subtotal	3.031	0.400		0.400		0.604		-	0.604	0.000	4.435	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
		Project Cost Totals	140.185	18.264		14.108		17.719		-		17.719	0.000	190.276	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023																
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)																					
2040 / 4													907 / <i>Tactical Exploitation Of National Capabilities</i>																
Event Name				FY 2022				FY 2023				FY 2024				FY 2025													
				1	2	3	4	1	2	3	4	1	2	3	4	1	2												
Core TENCAP Cross-Agency Advanced Development and Engineering																													
Development with Nat Intel Community																													
TGOSG - annual - guides FY25-29 POM				1																									
TGOSG - annual - guides FY26-30 POM				2																									
TGOSG - annual - guides FY27-31 POM				3																									
TGOSG - annual - guides FY28-32 POM				4																									
TGOSG - annual - guides FY29-33 POM				5																									
TGOSG - annual - guides FY30-34 POM				6																									
TGOSG - annual - guides FY31-35 POM				7																									
Air Vigilance Advanced Development/System prototype efforts																													
TRFE development and prototyping efforts																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Core TENCAP Cross-Agency Advanced Development and Engineering	1	2018	4	2028
TGOSG - annual - guides FY23-27 POM	2	2021	2	2021
TGOSG - annual - guides FY24-28 POM	4	2021	4	2021
TGOSG - annual - guides FY25-29 POM	4	2022	4	2022
TGOSG - annual - guides FY26-30 POM	4	2023	4	2023
TGOSG) - annual - guides FY27-31 POM	4	2024	4	2024
TGOSG) - annual - guides FY28-32 POM	4	2025	4	2025
TGOSG - annual - guides FY29-33 POM	4	2026	4	2026
TGOSG - annual - guides FY30-34 POM	4	2027	4	2027
TGOSG - annual - guides FY31-35 POM	4	2028	4	2028
Air Vigilance Advanced Development/System prototype efforts	3	2013	4	2028
TRFE development and prototyping efforts	1	2018	4	2028
MDSS (realigned to PE 0604036A, Proj BY9 in FY22)	1	2021	4	2021
LEO ISR (realigned to Proj CC5 in FY22)	1	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
BX9: <i>Tactical Intel Targeting Access Node Adv Develop</i>	-	20.003	22.767	20.872	-	20.872	18.274	17.457	17.643	17.841	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

This project funds development and prototyping of space-to-ground station capabilities to provide timely assured access to National and Commercial Space-Based Intelligence, Surveillance, and Reconnaissance (ISR) sensor data supporting commanders' situational understanding (patterns of life, threat intentions, etc.), indications & warnings (detection of enemy mobilization and hostile activity), and intelligence support to targeting (order of battle, electronic target folders, target detection, Battle Damage Assessment, etc.).

Funding for TITAN Advance Development funding will also prototype software analytic capabilities to increase the speed, precision and accuracy of the intelligence cycle through Automated/Assisted Sensor-to-Shooter (S2S) workflows. These capabilities will be integrated into the TITAN Ground Station Program of Record (POR).

FY2024 base funding in the amount of \$20.872 million enables the TENCAP program to dedicate appropriate engineering support to improve the TITAN Surrogates, TITAN Pre-Prototypes, and Space Ground Component Kits (SGCK) and ensure they continues to leverage legacy and emergent National Reconnaissance (NRO) Overhead Systems (NOS) and Commercial sensors in collaboration with required systems to receive required products through planned IC architectural changes over time. The SGCK is a component of the TITAN POR that provides TITAN access to space capabilities. The SGCK consists of a mission critical small form-factor antenna, specialized software, Automated Target Recognition tools, and enhanced interoperability with the fires architecture to support the Army's Long Range Precision Fires (LRPF) priority. The SGCK, originally developed by TENCAP, was integrated into the TITAN POR in FY23 and provides, rapid availability of National Reconnaissance Office (NRO) Overhead Systems (NOS) Geospatial Intelligence (GEOINT) and Signal Intelligence (SIGINT) data from Theater, National and Commercial sources. The TITAN Surrogates and TITAN Pre-Prototypes are systems that provide risk reduction and lessons learned to improve the TITAN POR.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Tactical Intelligence Targeting Access Node (TITAN) Adv Development Prototype System	FY 2022	FY 2023	FY 2024
Description: The SGCK is being integrated into the Tactical Intelligence Targeting Access Node (TITAN) POR, and provides the following capability to the Army:	20.003	22.767	20.872
1. Timely, assured intelligence for Long-Range Precision Fires (LRPF) and maneuver in contested and Anti-Access / Area-Denial (A2/AD) environments.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army								Date: March 2023				
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>			Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>							
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023	FY 2024		
2. Assured access to ISR sensor data collected at Commercial and National levels.												
3. Software analytics capability to enable the intelligence cycle with increased speed, precision, and accuracy.												
4. Automated/Assisted Sensor-to-Shooter (S2S) workflows with increased speed, scalability, and accuracy.												
5. Modern and consolidated ground station for National and Commercial sensors.												
FY 2023 Plans:	Continue to develop the Satellite Ground Component Kit (SGCK) using 6.4 Research Development, Test & Evaluation (RDT&E) funds. Integrate the SGCK into the Tactical Intelligence Targeting Access Node (TITAN) Program of Record using 6.5 (integration and tests) RDT&E funds. The integration of this capability will result in rapid availability of National Reconnaissance Office (NRO) Overhead Systems (NOS), Geospatial Intelligence (GEOINT), and Signal Intelligence (SIGINT) capabilities to the Warfighter. Funding will also support the continuation of the following related efforts: development and prototyping of emerging sensor analytics in the TITAN Integration Environment (TIE), development and refinement of small form-factor antenna, and development of Automated Target Recognition tools and enhanced interoperability with the fires architecture to support Army's Long Range Precision Fires (LRPF) priority.											
FY 2024 Plans:	Improve TITAN Surrogates, TITAN (space) Pre-Prototypes, and Space Ground Component Kits (SGCK) through Pre-Planned Program Improvements (P3I) to ensure they continue to leverage legacy and emergent NOS and Commercial sensors in collaboration with required systems to receive required products through planned IC architectural changes over time. This will be accomplished by integrating planned Commercial and IC space-based sensors. Also, funding will be used to sustain TITAN Surrogates, TITAN (space) Pre-prototypes 1 and 2 delivered to units for experimentation, and SGCKs 1 and 2.											
FY 2023 to FY 2024 Increase/Decrease Statement:	The decrease of \$1.895 million between FY23 (\$22.767 million) and FY24 (\$20.872 million) funding is a result of the improved development process and efficiencies accomplished during TITAN (space) Pre-Prototype development and prototyping efforts.											
Accomplishments/Planned Programs Subtotals								20.003	22.767	20.872		
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024	Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 0605766A: <i>National Capabilities Integration (MIP)</i>	13.454	17.030	15.129	-	15.129	16.953	17.358	17.542	17.738	0.000	115.204	
Remarks	BX9 development activities are conducted in concert with integration funded in PE 0605766A BV3.											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>
D. Acquisition Strategy <p>The TITAN (space) Pre-Prototype requirement was validated by the TENCAP General Officer Steering Group (TGOSG) in April 2019. In order to maximize agility and innovation in acquisition, TENCAP worked with the Defense Innovation Unit (DIU) to establish an Other Transaction Authority (OTA) agreement to develop the TITAN (space) Pre-Prototype and follow-on SGCK capabilities. The TITAN (space) Pre-Prototype provides a modernized, deployable, ground station capable of rapidly and semi-autonomously tasking, receiving, processing, exploiting, fusing, and disseminating space-based sensor data to provide networked situational awareness and direct tactical support to Army commanders at echelon. The TITAN (space) Pre-Prototype continues to reduce Sensor-to-Shooter (S2S) latency to allow timely intelligence support to the commander. The TITAN (space) Pre-Prototype uses an agile acquisition strategy and will continue to maximize non-proprietary / modular open system architectures (MOSA), to enable easy upgrade of software/ firmware, analytics/algorithms, and ingest additional data streams as commercial vendors and national data become available. This OTA was preceded by Soldier touchpoints to inform this acquisition, and Soldier engagement is planned throughout the development and demonstration of the TITAN (space) Pre-Prototype. The capabilities successfully demonstrated in the TITAN (space) Pre-Prototype are used to develop the SGCK that is integrated into the TITAN POR and will be improved and updated as required to ensure continued effectiveness throughout planned National Overhead System Architecture changes. The capabilities and interfaces will be improved and updated as required to ensure continued effectiveness throughout planned National Overhead System Architecture changes.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603766A / Tactical Electronic Surveillance System - Adv Dev				Project (Number/Name) BX9 / Tactical Intel Targeting Access Node Adv Develop							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TITAN Engineering Services	MIPR	Army Geospatial Center (AGC) : Alexandria, VA	0.001	1.500	Jan 2022	1.500	Jan 2023	1.369	Jan 2024	-		1.369	0.000	4.370	-
Subtotal		0.001	1.500			1.500		1.369		-		1.369	0.000	4.370	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TITAN (space) Pre-Prototype Development	C/FFP	Northrup Grumman : Aurora, CA	0.001	15.503	Jan 2022	18.102	Nov 2022	11.334	Feb 2024	-		11.334	0.000	44.940	-
Subtotal		0.001	15.503			18.102		11.334		-		11.334	0.000	44.940	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TITAN (space) Pre-Prototype Operations and Support	MIPR	Army TENCAP : Alexandria, VA	0.001	2.000	Jan 2022	2.150	Oct 2022	7.242	Feb 2024	-		7.242	0.000	11.393	-
Subtotal		0.001	2.000			2.150		7.242		-		7.242	0.000	11.393	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TITAN (space) Pre-Prototype Test and Exercises	MIPR	Multiple : Miltiple	0.001	1.000	Jan 2022	1.015	Jan 2023	0.927	Jan 2024	-		0.927	0.000	2.943	-
Subtotal		0.001	1.000			1.015		0.927		-		0.927	0.000	2.943	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.004	20.003	22.767		20.872		-		20.872	0.000	63.646	N/A
Remarks												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023					
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)										
2040 / 4				PE 0603766A / Tactical Electronic Surveillance System - Adv Dev				BX9 / Tactical Intel Targeting Access Node Adv Develop										
				FY 2022				FY 2023				FY 2024				FY 2025		
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	
National Overhead Systems (NOS) Integration																		
Risk Reduction w/Legacy Ground Systems																		
TITAN (space) Pre-Production Development																		
TITAN (space) Pre-Prototype 1 Delivery																		
TITAN (space) Pre-Prototype 2 Delivery																		
TITAN Pre-Prototype Demonstrations and Assessment																		
Contract Award																		
Continued advancement for Space capabilities via exercises																		
Defender Pacific 22																		
Northern Edge 22																		
Dynamic Front 22																		
Project Convergence 22 (Use TPP 1)																		
SCGK Delivery																		

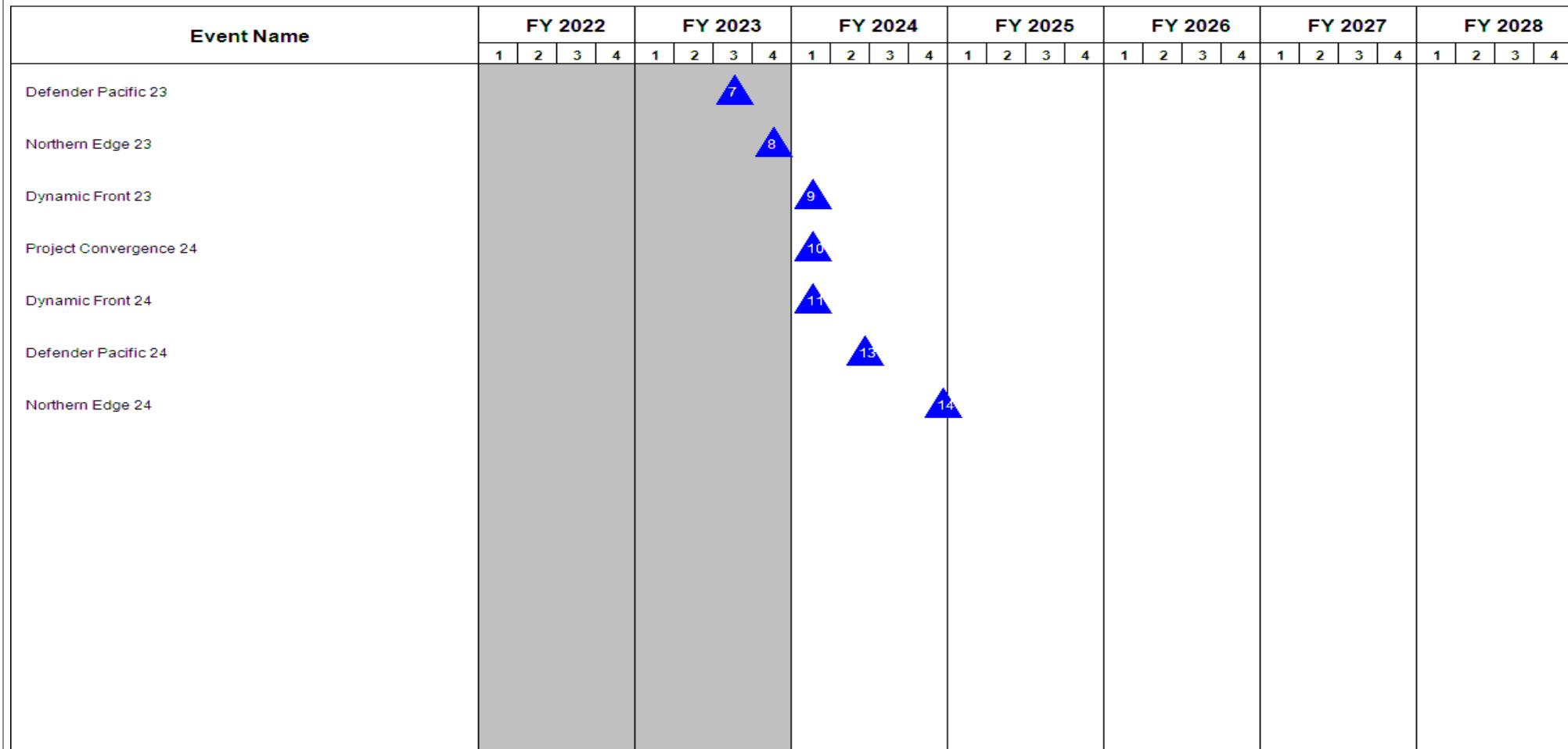
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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

2040 / 4

R-1 Program Element (Number/Name)PE 0603766A / *Tactical Electronic Surveillance System - Adv Dev***Project (Number/Name)**BX9 / *Tactical Intel Targeting Access Node Adv Develop*

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
National Overhead Systems (NOS) Integration	1	2021	4	2028
Risk Reduction w/Legacy Ground Systems	1	2020	4	2027
TITAN (space) Pre-Production Development	4	2020	4	2022
TITAN (space) Pre-Prototype 1 Delivery	4	2022	4	2022
TITAN (space) Pre-Prototype 2 Delivery	1	2023	1	2023
TITAN Pre-Prototype Demonstrations and Assessment	4	2022	1	2028
Contract Award	2	2024	2	2024
Continued advancement for Space capabilities via exercises	1	2022	4	2027
Defender Pacific 22	3	2022	3	2022
Northern Edge 22	3	2022	3	2022
Dynamic Front 22	4	2022	4	2022
Project Convergence 22 (Use TPP 1)	1	2023	1	2023
SCGK Delivery	2	2023	1	2024
Defender Pacific 23	3	2023	3	2023
Northern Edge 23	4	2023	4	2023
Dynamic Front 23	1	2024	1	2024
Project Convergence 24	1	2024	1	2024
Dynamic Front 24	1	2024	1	2024
Defender Pacific 24	2	2024	2	2024
Northern Edge 24	4	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
CC5: <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>	-	75.098	35.439	26.976	-	26.976	2.372	1.967	2.056	2.079	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
Note													
All funding is in support of the ACTIVE COMPONENT.													
A. Mission Description and Budget Item Justification													
Low Earth Orbit (LEO) Intelligence, Surveillance and Reconnaissance (ISR) directly supports the Army Assured Position Navigation and Timing/Space (APNT/S) and Long Range Precision Fires (LRPF) modernization priorities.													
The LEO ISR effort will provide prototyping, development, and experimentation of High Altitude and Tactical Space Layer (TSL) sensors (including electro optical, synthetic aperture radar, radio frequency, and hyperspectral) and space-based Alternative Positioning, Navigation, and Timing (ALTPNT) systems, which are designed to provide wide-area, responsive, deep-area sensing and alternative signal sources required for beyond-line-of-sight (BLOS) targeting and force maneuver. The BLOS sensing will significantly reduce Sensor-to-Shooter (S2S) timelines and reliance on current, at-risk signal sources. Follow-on, persistent, prototype, tactical sensor and alternative signal capabilities will be integrated with the Army Tactical Intelligence Targeting Access Node (TITAN) ground station and theater gateways. The prototype sensor capabilities will provide direct tasking, assured access, and freedom of maneuver directly supporting live-fire, S2S demonstrations and assessments.													
FY2024 Base funding in the amount of \$26.976 million provides prototyping, experimentation, and risk reduction activities to space-based sensor and ALTPNT prototype systems, supporting wide-area, responsive, and deep-area sensing and force maneuver. It will enable ground stations to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024
Title: CC5 / Low Earth Orbit (LEO) Intel Surv Recon (ISR)											75.098	35.439	26.976
Description: The LEO ISR effort provides prototyping, development and experimentation of High Altitude and Tactical Space Layer (TSL) prototype sensors (including electro-optical, synthetic aperture radar, and radio frequency). These sensors are designed to provide wide-area, responsive, deep-area sensing required for beyond-line-of-sight (BLOS) targeting and force maneuver, and will significantly reduce Sensor-to-Shooter (S2S) timelines. Follow-on persistent prototype tactical sensor capabilities will be integrated with the Army TITAN ground station and theater gateways, which will provide direct tasking and assured access directly supporting live-fire S2S demonstrations and assessments.													
FY 2023 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>						
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023	FY 2024			
Funding provides for follow-on prototype development and experimentation of High Altitude and Tactical Space Layer sensor test beds, which will be integrated with the Army TITAN ground station and ATHENA gateways, to provide direct tasking and assured access directly supporting live-fire STS demonstrations and assessments.													
FY 2024 Plans: Funding provides for follow-on development, experimentation and support of prototype High Altitude and Tactical Space Layer sensor test beds (electro optical, synthetic aperture radar, radio frequency, and hyperspectral) and space-based Alternative Positioning, Navigation, and Timing (ALTPNT) systems, which will be integrated with the Army TITAN ground station and theater gateways to provide direct tasking and assured access directly supporting live-fire S2S demonstrations and assessments and Project Convergence events.													
FY 2023 to FY 2024 Increase/Decrease Statement: The decrease of \$8.463M from FY 2023 (\$35.439 million) down to FY 2024 (\$26.976 million) is part of a planned reduction of CC5 investment that reflects the successful development, prototyping, and risk reduction activities of space-based sensor hardware and software. Initial stages of both the Geospatial Intelligence and Alternate Position Navigation and Timing systems required a significant outlay of funds during initial years for Non-Recurring Engineering and Long-lead items in order to develop the sensors and to ensure transport of the sensors on space vehicles developed in conjunction with the IC and Space Development Agency. Once initial costs were provided to the project partners in initial years, costs in later years are reduced to support testing and accomplishment of initial objectives.								75.098	35.439	26.976			
Accomplishments/Planned Programs Subtotals													
C. Other Program Funding Summary (\$ in Millions)													
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete			
• 0604035A: <i>Low Earth Orbit (LEO) Satellite Capability</i>	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing			
Remarks													
Development by Project CC5 "LEO ISR" are in conjunction and complement efforts funded by Project BX7 "LEO Satellite Capability." ref. PE 0604035A.BX7													
D. Acquisition Strategy													
The LEO ISR effort supports work with the Intelligence Community (IC), our Mission Partner, and the Space Development Agency on the prototyping, development, experimentation and support of High Altitude and Tactical Space Layer (TSL) prototype sensors (including electro optical, synthetic aperture radar, radio frequency, and hyperspectral), and Alternative Positioning, Navigation, and Timing (ALTPNT) systems. These sensors are designed to provide wide-area, responsive, deep-area sensing required for BLOS targeting and force maneuver, significantly reducing S2S timelines. Follow-on, persistent, prototype tactical sensor capabilities (FY													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>
	Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>
2024-2025) will be integrated with the Army TITAN ground station and theater gateways, which will provide direct tasking, assured access, and freedom of maneuver directly supporting live-fire S2S demonstrations and assessments. Existing Mission Partner contracts and Aviation & Missile Technology Consortium (AMTC) Other Transaction Authority (OTAs) will be used for prototype development, engineering services and test and evaluation support.	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603766A / Tactical Electronic Surveillance System - Adv Dev				Project (Number/Name) CC5 / Low Earth Orbit (LEO) / Intel Surv Recon (ISR)							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LEO Prototype Development and Engineering Services Support	C/FFP	A-PNT /S : Multiple Locations	-	5.000	Oct 2021	4.000	Jun 2023	3.000	Jun 2024	-		3.000	0.000	12.000	-
Subtotal				5.000		4.000		3.000		-		3.000	0.000	12.000	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LEO Development (Classified)	MIPR	TBD : TBD	-	58.598	Jan 2022	26.939	Jan 2023	20.576	Jan 2024	-		20.576	0.000	106.113	-
Subtotal				58.598		26.939		20.576		-		20.576	0.000	106.113	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LEO Program MGMT	TBD	APNT CFT/S : Huntsville, AL	-	3.500	Oct 2021	2.500	Jun 2023	1.900	Jun 2024	-		1.900	0.000	7.900	-
Subtotal				3.500		2.500		1.900		-		1.900	0.000	7.900	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LEO Prototype Tests and Evaluations	TBD	Multiple : Multiple	-	8.000	Jan 2022	2.000	Jan 2023	1.500	Jan 2024	-		1.500	0.000	11.500	-
Subtotal				8.000		2.000		1.500		-		1.500	0.000	11.500	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) CC5 / Low Earth Orbit (LEO) / Intel Surv Recon (ISR)					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	75.098	35.439		26.976		-		26.976	0.000	137.513	N/A
Remarks												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)								
2040 / 4				PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>					CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>								
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sensor-to-Shooter Campaign of Learning																	
CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>																	
		<i>prototyping, development, and experimentation</i>															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) CC5 / Low Earth Orbit (LEO) / Intel Surv Recon (ISR)	
Schedule Details			
Events	Start	End	
Sensor-to-Shooter Campaign of Learning	Quarter 1	Year 2022	Quarter 4
CC5 / Low Earth Orbit (LEO) / Intel Sur Recon (ISR)	Quarter 1	Year 2022	Quarter 4
			2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603774A / Night Vision Systems Advanced Development											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
Total Program Element	-	62.534	97.478	73.675	-	73.675	34.683	35.422	35.800	36.199	Continuing	Continuing				
BQ5: Visual Augmentation System Advanced Development	-	56.463	86.594	67.935	-	67.935	29.084	29.703	30.021	30.356	Continuing	Continuing				
VT7: Soldier Maneuver Sensors - Adv Dev	-	3.639	8.839	3.729	-	3.729	3.589	3.707	3.746	3.787	Continuing	Continuing				
VT8: SOLDIER PRECISION TARGETING DEVICES - ADV DEV	-	2.432	2.045	2.011	-	2.011	2.010	2.012	2.033	2.056	Continuing	Continuing				
A. Mission Description and Budget Item Justification																
A portion of this funding line is directly aligned to the Army Soldier Lethality Modernization Priority in support of situational awareness for the Close Combat Soldier. This Program Element focuses on efforts to evaluate and integrate technologies and representative prototype systems that facilitate the development of Soldier-borne sensor devices transitioning from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide enhanced Soldier products, giving them superiority on the battlefield.																
Project BQ5 (Visual Augmentation System-Advanced Development) This project evaluates and integrates technologies and representative prototype systems transitioning from the Science and Technology (S&T) stage. It focuses on developing the next generation augmented vision and situational awareness system that provides the Soldier with the ability to fight, rehearse, train and win during multi-domain operations. Funded efforts will accelerate the development of components, terrain shared coordinate data and processing, algorithms including machine learning/artificial intelligence and demonstrations in support of the next generation augmented vision and situational awareness system. Efforts will provide rapid decision making and passive targeting capabilities with the integration of external video and data sources such as weapon sights, unmanned air and ground vehicles and other data sources enabled by tactical cloud package and advanced network services. This project will provide data driven analytics to optimize unit performance and enhance lethality and to enable Synthetic Training Environment (STE) squad capability to perform live mixed reality training and rehearsing. This project includes costs for efforts associated with movement of information and high-level processing, integration, and interface of products with the Soldiers' head, body, weapon, and transportation. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy. This project supports the Soldier Lethality Cross Functional Team.																
The total cost of the Integrated Visual Augmentation System Rapid Prototyping Middle Tier of Acquisition effort was \$871 million RDT&E from FY18 to FY21. The total cost of the IVAS 1.2 Middle Tier of Acquisition effort is \$221 million RDT&E from FY23 to FY24.																
Project VT7 (Soldier Maneuver Sensors-Advanced Development) project enables development of emerging capabilities for the maneuver force, that are envisioned by the Soldier Lethality Cross Functional Team, the Maneuver Center of Excellence (MCoE), the Maneuver Capabilities Development Integration Directorate (MCDID), the Science and Technology (S&T) community, industry partners or the acquisition workforce that may provide the Soldier or Squad increased capability to "fight, win and																

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>
<p>survive, day and night, in a multi-domain environment now and tomorrow". This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. This effort focuses on capabilities that enable modernization of Soldier sensor and laser devices, including digital features and enhanced solutions including maneuver capabilities to detect, recognize and identify targets, and to provide target acquisition and handoff but not limited to capabilities to mitigate threats. The integration of higher performing multi-spectral sensors with smart processing will provide adjusted weapon sight reticles and leverage network connectivity for improved situational awareness/understanding. Additional project capabilities include advanced optical components and assemblies and techniques for signature management, resiliency across the electromagnetic spectrum, and integration of a modular design structure for target acquisition applications including support for wireless data transfer, passive range determination, technologies for working in a global positioning system (GPS) contested environment, advanced GPS replacement technologies and mitigation of manned and unmanned threat sensor systems. This project supports efforts to evaluate and integrate technologies and representative prototype systems including Micro Electronics Modules (MEMS) technology with improved size, weight and power for development of modernized Soldier sensor capabilities transitioning from the S&T stage to operational use. This project includes costs for efforts associated with development, certification, verification and validation of interface products into the Adaptive Squad Architecture (ASA). This project also includes development of tools and emulators of ASA components. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.</p> <p>Project VT8 (Soldier Precision Targeting Devices - Advanced Development) enables development of emerging technologies for the Fires community, that are envisioned by the Fires Center of Excellence (FCoE), the Fires Capabilities Development Integration Directorate (FCDID), the Science and Technology (S&T) community, industry partners and the acquisition workforce that provide the Fire Support Soldier increased capability and reduced weight to improve operational effectiveness. This project focuses on developing component technologies and representative prototype systems for Soldier portable precision targeting devices to continue improvements to system performance while reducing size, weight, and power required by those systems. The effort will consider emerging Micro-Electronic Modules (MEMs) technologies for improved efficiency and performance. Efforts will improve the Soldier's ability to precisely locate and laser designate targets across a broader range of operating environments, including all weather conditions and in GPS-contested environments using active and passive methods and technologies. Component technology development will precede integration into specific systems and will include improved Precision Azimuth and Vertical Angle Measurement (PAVAM) devices; solid-state, improved lasers for range finding/designation/marking; novel passive target acquisition methods; electro-optical sensors such as infrared, near-infrared, ultra-violet, and visible spectrum imagers; sensor and data fusion; laser designator spot detection and imaging; integration of advanced power management technologies, and GPS M-Code receivers. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.</p>	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603774A / Night Vision Systems Advanced Development			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	62.820	18.048	75.231	-	75.231
Current President's Budget	62.534	97.478	73.675	-	73.675
Total Adjustments	-0.286	79.430	-1.556	-	-1.556
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	79.430			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.286	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.556	-	-1.556
Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2022	FY 2023			
Project: BQ5: Visual Augmentation System Advanced Development					
Congressional Add: FY22 Congressional Add					
	55.000	-			
Congressional Add Subtotals for Project: BQ5					
	55.000	-			
Congressional Add Totals for all Projects					
	55.000	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603774A / Night Vision Systems Advanced Development				BQ5 / Visual Augmentation System Advanced Development				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
BQ5: Visual Augmentation System Advanced Development	-	56.463	86.594	67.935	-	67.935	29.084	29.703	30.021	30.356	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

This project evaluates and integrates technologies and representative prototype systems transitioning from the Science and Technology (S&T) stage. It focuses on developing the next generation augmented vision and situational awareness system that provides the Soldier with the ability to fight, rehearse, train and win during multi-domain operations. Funded efforts will accelerate the development of components, terrain shared coordinate data and processing, algorithms including machine learning/artificial intelligence and demonstrations in support of the next generation augmented vision and situational awareness system. Efforts will provide rapid decision making and passive targeting capabilities with the integration of external video and data sources such as weapon sights, unmanned air and ground vehicles and other data sources enabled by tactical cloud package and advanced network services. This project will provide data driven analytics to optimize unit performance and enhance lethality and to enable Synthetic Training Environment (STE) squad capability to perform live mixed reality training and rehearsing. This project includes costs for efforts associated with movement of information and high-level processing, integration, and interface of products with the Soldiers' head, body, weapon, and transportation. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy. This project supports the Soldier Lethality Cross Functional Team.

The total cost of the Integrated Visual Augmentation System Rapid Prototyping Middle Tier of Acquisition effort was \$871 million RDT&E from FY18 to FY21. The total cost of the IVAS 1.2 Middle Tier of Acquisition effort is \$221 million RDT&E from FY23 to FY24.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: Heads Up Display (HUD)	1.463	86.153	67.935
Description: Integrated Visual Augmentation System (IVAS) HUD provides a multiple generation single platform for Soldier to fight, rehearse, and train in day and night that provides increased lethality, mobility, and situational awareness necessary to achieve overmatch against our current and future adversaries.			
FY 2023 Plans: Integrate imagers, hardware components, and software into IVAS 1.2. Improve thermal and low light sensors while improving HUD form factor.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023						
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development			Project (Number/Name) BQ5 / Visual Augmentation System Advanced Development											
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2022	FY 2023	FY 2024						
Improve HUD design by integrating improved sensors and updating hardware components and software into IVAS 1.2. Improve thermal and low light sensors, develop AI data integration, improve IVAS extensibility, improve form factor, and reliability, reduce weight and develop applications.																	
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in funding for FY 2024 reflects costs for IVAS 1.2 developmental efforts.																	
Title: SBIR/STTR Transfer																	
Description: Funding transferred in accordance with Title 15 USC 638																	
FY 2023 Plans: Funding transferred in accordance with Title 15 USC 638																	
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638.																	
Accomplishments/Planned Programs Subtotals											1.463 86.594 67.935						
											FY 2022 FY 2023						
Congressional Add: FY22 Congressional Add											55.000 -						
FY 2022 Accomplishments: Development of human factors and user experience updates to IVAS systems.																	
Congressional Adds Subtotals											55.000 -						
C. Other Program Funding Summary (\$ in Millions)																	
Line Item		FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete						
• K36402: IVAS/Heads Up Display		405.140	-	89.451	-	89.451	-	-	-	-	Continuing						
• BQ6: Visual Augmentation System Eng Dev		6.254	68.043	7.973	-	7.973	70.982	72.490	73.262	74.079	Continuing						
Remarks																	
D. Acquisition Strategy																	
This project utilizes competitively awarded contracts using best value source selection procedures.																	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development				Project (Number/Name) BQ5 / Visual Augmentation System Advanced Development							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	VARIOUS : VARIOUS	2.758	-		4.589	Sep 2023	5.349	Nov 2023	-		5.349	0.000	12.696	-
SBIR/STTR Transfer	TBD	To Be Determined : To Be Determined	-	-		0.441	Mar 2023	-	-	-		-	0.000	0.441	-
Subtotal		2.758	-		5.030			5.349		-		5.349	0.000	13.137	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Heads Up Display (HUD)	C/FFP	Microsoft : Redmond, WA	185.347	47.927	Dec 2022	61.888	Dec 2023	44.598	Mar 2024	-		44.598	0.000	339.760	-
Heads Up Display (HUD)	TBD	To Be Determined : To Be Determined	1.041	8.536	Sep 2022	18.906	Mar 2023	13.658	Mar 2024	-		13.658	0.000	42.141	-
Vehicle Integration	C/TBD	TBD : TBD	-	-		0.270	Feb 2023	0.540	Mar 2024	-		0.540	0.000	0.810	-
Subtotal		186.388	56.463		81.064			58.796		-		58.796	0.000	382.711	N/A

Remarks

Of the \$62.719M in FY 2023 for the Heads Up Display for Microsoft, only \$917K is carried over to be award in December 2023.

Of the \$18.906M in the various Heads Up Display, \$18M is Congressionally earmarked for day/light display of \$12M, immersive AR/VR of \$2M, and universal HUD of \$4M. These funds need to be transferred over to VT7 for execution. Thus, only \$906K will be awarded in March 2023.

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems, Test and Evaluation	TBD	Various : Various	1.657	-		0.500	Feb 2023	3.790	Mar 2024	-		3.790	0.000	5.947	-
Subtotal		1.657	-		0.500			3.790		-		3.790	0.000	5.947	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development				Project (Number/Name) BQ5 / Visual Augmentation System Advanced Development					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	190.803	56.463	86.594		67.935		-		67.935	0.000	401.795	N/A
Remarks Some cost categories include multiple efforts, so award date is the last date where funds were awarded.												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

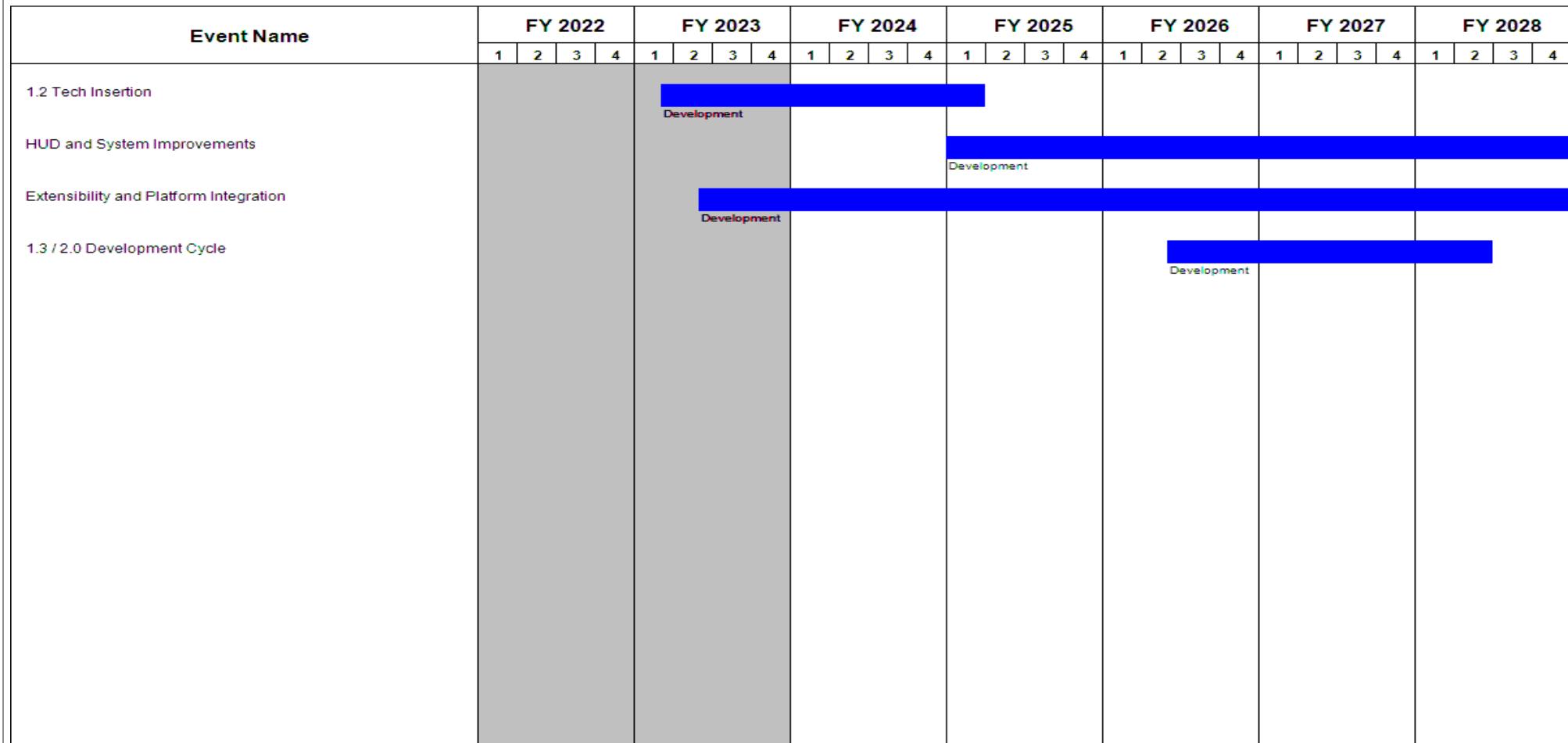
2040 / 4

R-1 Program Element (Number/Name)

PE 0603774A / Night Vision Systems Advanced Development

Project (Number/Name)

BQ5 / Visual Augmentation System Advanced Development



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development	Project (Number/Name) BQ5 / Visual Augmentation System Advanced Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Heads Up Display (HUD)	4	2018	4	2020
1.2 Tech Insertion	1	2023	1	2025
HUD and System Improvements	1	2025	4	2028
Extensibility and Platform Integration	2	2023	4	2028
1.3 / 2.0 Development Cycle	2	2026	2	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603774A / Night Vision Systems Advanced Development				VT7 / Soldier Maneuver Sensors - Adv Dev				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
VT7: Soldier Maneuver Sensors - Adv Dev	-	3.639	8.839	3.729	-	3.729	3.589	3.707	3.746	3.787	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
A. Mission Description and Budget Item Justification													
This project enables development of emerging capabilities for the maneuver force, that are envisioned by the Soldier Lethality Cross Functional Team, the Maneuver Center of Excellence (MCoE), the Maneuver Capabilities Development Integration Directorate (MCDID), the Science and Technology (S&T) community, industry partners or the acquisition workforce that may provide the Soldier or Squad increased capability to "fight, win and survive, day and night, in a multi- domain environment now and tomorrow". This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. This effort focuses on capabilities that enable modernization of Soldier sensor and laser devices, including digital features and enhanced solutions including maneuver capabilities to detect, recognize and identify targets, and to provide target acquisition and handoff but not limited to capabilities to mitigate threats. The integration of higher performing multi-spectral sensors with smart processing will provide adjusted weapon sight reticles and leverage network connectivity for improved situational awareness/understanding. Additional project capabilities include advanced optical components and assemblies and techniques for signature management, resiliency across the electromagnetic spectrum, and integration of a modular design structure for target acquisition applications including support for wireless data transfer, passive range determination, technologies for working in a global positioning system (GPS) contested environment, advanced GPS replacement technologies and mitigation of manned and unmanned threat sensor systems. This project supports efforts to evaluate and integrate technologies and representative prototype systems including Micro Electronics Modules (MEMS) technology with improved size, weight and power for development of modernized Soldier sensor capabilities transitioning from the S&T stage to operational use. This project includes costs for efforts associated with development, certification, verification and validation of interface products into the Adaptive Squad Architecture (ASA). This project also includes development of tools and emulators of ASA components. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024
Title: Soldier Enhanced Sensing Capabilities											3.639	8.696	3.729
Description: Soldier Enhanced Sensing Capabilities provides the next generation vision capabilities for day and night that will reduce the Soldier's burden and allow hands free operation. Soldier Enhanced Sensing Capabilities will provide automatic adjustment of imagery and matched sensor fields of view. This effort will further enhance day/night Rapid Target Acquisition (RTA) capabilities by ensuring goggle connectivity to weapon sights, and improved situational capabilities by enabling day/night data display on the Soldier Warrior End User Device/Computer (EUD) and Soldier Borne Sensor systems. The goggle interface will be compatible with Integrated Visual Augmentation System (IVAS) displays. This effort considers methods for obtaining range estimates without the use of active laser devices and extends the ability to send/receive data to the EUD to support advanced EUD applications by processing of sensor video, integrating it with external data sources, and producing advanced processed imagery with overlay data display. This effort will review and consider improved antenna designs and placement to maximize													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development				Project (Number/Name) VT7 / Soldier Maneuver Sensors - Adv Dev					
B. Accomplishments/Planned Programs (\$ in Millions)					FY 2022	FY 2023	FY 2024					
efficiencies of wireless communications. This effort will further work to reduce size, weight and power of sensor and laser components including consideration of MEMS technology and considers IVAS successes to explore integrated digital, low profile, conformal day/night displays. This effort considers alternatives to potentially replace or augmenting the aging fleet of fielded night vision devices with a digital Near-Infrared (NIR) device, a peripheral overlay device, a bi-focal lens vision device, an adjustable objective lens, a wide field of view device and/or a white phosphor night vision device.												
<p>FY 2023 Plans: Continue development and integration of Augmented Reality (AR), Artificial Intelligence (AI) and Machine Learning (ML) as they relate to Soldier Maneuver platforms. Integrate and analyze benefits versus size, weight and power impacts of emerging RTI technologies that immerse the individual Soldier in the Digital Battlefield.</p> <p>FY 2024 Plans: Continue development and integration of Augmented Reality (AR), Artificial Intelligence (AI) and Machine Learning (ML) as they relate to Soldier Maneuver platforms. Integrate and analyze benefits versus size, weight and power impacts of emerging RTI technologies that immerse the individual Soldier in the Digital Battlefield.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in funding from FY 2023 to FY 2024 is due to the schedule of efforts for the program.</p> <p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC 638.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638.</p>	-		0.143	-								
Accomplishments/Planned Programs Subtotals								3.639	8.839	3.729		
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• L67: Soldier Night Vision Devices	11.482	4.435	6.061	-	6.061	5.826	5.716	5.776	5.840	Continuing	Continuing	
• K22002: FWS-INDIVIDUAL	151.956	143.833	129.807	-	129.807	147.556	95.922	94.803	94.234	0.000	858.111	
• K22003: FWS-CREW SERVED	25.673	33.850	42.649	-	42.649	51.220	-	-	46.863	Continuing	Continuing	
• K22004: FWS-SNIPER	11.101	11.000	13.178	-	13.178	13.491	13.213	13.483	13.711	Continuing	Continuing	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development						Project (Number/Name) VT7 / Soldier Maneuver Sensors - Adv Dev	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• B53800: Laser Target Locator Systems	27.771	34.229	21.539	-	21.539	22.055	2.820	2.846	21.942	Continuing	Continuing
• K35110: Small Tactical Optical Rifle Mounted MLRF	21.103	11.357	15.484	-	15.484	11.119	2.217	1.599	11.338	Continuing	Continuing
• K36402: IVAS/Heads Up Display System Advanced Development	405.140	-	89.451	-	89.451	-	-	-	-	Continuing	Continuing
• BQ5: Visual Augmentation System Advanced Development	56.463	86.594	67.935	-	67.935	29.084	29.703	30.021	30.356	Continuing	Continuing
• BQ6: Visual Augmentation System Eng Dev	6.254	68.043	7.973	-	7.973	70.982	72.490	73.262	74.079	Continuing	Continuing
• K36400: Helmet Mounted Enhanced Vision Devices	234.906	300.000	30.153	-	30.153	-	-	-	-	0.000	565.059
Remarks											
D. Acquisition Strategy											
The various developmental programs in this Project continue to exercise competitively awarded contracts using best value source selection procedures.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development				Project (Number/Name) VT7 / Soldier Maneuver Sensors - Adv Dev								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management	MIPR	Various : Various	1.410	0.288	Jun 2022	0.205	Feb 2023	0.360	Dec 2023	-		0.360	Continuing	Continuing	-	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.143	Mar 2023	-	-	-		0.000	0.143	-		
Subtotal		1.410	0.288			0.348		0.360		-		0.360	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Soldier Enhanced Sensing Capabilities	MIPR	C5ISR (RTI) : FT BELVOIR, VA	7.153	3.201	Jan 2022	8.412	Jun 2023	3.214	Jan 2023	-		3.214	Continuing	Continuing	-	
Subtotal		7.153	3.201			8.412		3.214		-		3.214	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Matrix Support	MIPR	C5ISR (RTI) : FT BELVOIR, VA	1.863	0.150	Jun 2022	0.079	Dec 2022	0.155	Dec 2023	-		0.155	Continuing	Continuing	-	
Subtotal		1.863	0.150			0.079		0.155		-		0.155	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				10.426	3.639		8.839		3.729		-		3.729	Continuing	Continuing	N/A
<u>Remarks</u>																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023						
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)											
2040 / 4				PE 0603774A / Night Vision Systems Advanced Development				VT7 / Soldier Maneuver Sensors - Adv Dev											
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		FY 2028	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Soldier Enhanced Sensing Capabilities	Development																		

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development	Project (Number/Name) VT7 / Soldier Maneuver Sensors - Adv Dev

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Soldier Enhanced Sensing Capabilities	1	2019	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603774A / Night Vision Systems Advanced Development				VT8 / SOLDIER PRECISION TARGETING DEVICES - ADV DEV				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
VT8: SOLDIER PRECISION TARGETING DEVICES - ADV DEV	-	2.432	2.045	2.011	-	2.011	2.010	2.012	2.033	2.056	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
A. Mission Description and Budget Item Justification													
This project enables development of emerging technologies for the Fires community, that are envisioned by the Fires Center of Excellence (FCoE), the Fires Capabilities Development Integration Directorate (FCDID), the Science and Technology (S&T) community, industry partners and the acquisition workforce that provide the Fire Support Soldier increased capability and reduced weight to improve operational effectiveness. This project focuses on developing component technologies and representative prototype systems for Soldier portable precision targeting devices to continue improvements to system performance while reducing size, weight, and power required by those systems. The effort will consider emerging Micro-Electronic Modules (MEMs) technologies for improved efficiency and performance. Efforts will improve the Soldier's ability to precisely locate and laser designate targets across a broader range of operating environments, including all weather conditions and in GPS-contested environments using active and passive methods and technologies. Component technology development will precede integration into specific systems and will include improved Precision Azimuth and Vertical Angle Measurement (PAVAM) devices; solid-state, improved lasers for range finding/designation/marking; novel passive target acquisition methods; electro-optical sensors such as infrared, near-infrared, ultra-violet, and visible spectrum imagers; sensor and data fusion; laser designator spot detection and imaging; integration of advanced power management technologies, and GPS M-Code receivers. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Precision Pointing and Navigation Component Development Description: This project supports development of advanced components and prototype systems for Soldier-borne precision targeting devices. Dismounted Soldiers will have the capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets and battlefield threats 24/7, across a broader range of operating environments such as in all weather conditions, in GPS-contested conditions using active and passive methodologies and technologies. FY 2023 Plans: FY 2023 resources will continue the development and initiate testing of component technologies and mature sub-system integration for PAVAM devices to achieve reduced size, weight and power. These resources will also continue to develop technologies that allow precision targeting systems to operate in GPS-contested environments. FY 2024 Plans:										FY 2022	FY 2023	FY 2024	
										2.432	1.970	2.011	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development				Project (Number/Name) VT8 / SOLDIER PRECISION TARGETING DEVICES - ADV DEV							
B. Accomplishments/Planned Programs (\$ in Millions)						FY 2022		FY 2023		FY 2024					
FY 2024 resources will continue the development and initiate testing of component technologies and mature sub-system integration for PAVAM devices to achieve reduced size, weight and power. These resources will also continue to develop technologies that allow precision targeting systems to operate in GPS-contested environments.															
FY 2023 to FY 2024 Increase/Decrease Statement: The increase is due to a projected rise in development and testing costs.															
Title: SBIR/STTR Transfer								-		0.075					
Description: Funding transferred in accordance with Title 15 USC 638															
FY 2023 Plans: Funding transferred in accordance with Title 15 USC 638.															
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638.															
Accomplishments/Planned Programs Subtotals											2.432				
2.045											2.011				
C. Other Program Funding Summary (\$ in Millions)															
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
• L79: Joint Effects Targeting Systems (JETS)	4.929	11.434	24.165	-	24.165	19.973	6.486	5.900	5.965	0.000	78.852				
• K32101: JOINT EFFECTS TARGETING SYSTEM (JETS)	62.082	2.576	8.932	-	8.932	9.347	69.020	69.683	69.753	0.000	291.393				
Remarks															
D. Acquisition Strategy The various developmental programs in this project continue to exercise competitively awarded contracts using best value source selection procedures.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development						Project (Number/Name) VT8 / SOLDIER PRECISION TARGETING DEVICES - ADV DEV				
Management Services (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management	MIPR	PM IVAS : Ft. Belvoir, VA 22060	0.130	0.226	May 2022	0.239	Feb 2023	0.244	Dec 2023	-		0.244	Continuing	Continuing	-	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.075	Mar 2023	-	-	-	-	0.000	0.075	-		
Subtotal			0.130	0.226		0.314		0.244		-		0.244	Continuing	Continuing	N/A	
Product Development (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Precision Pointing and Navigation	C/FFP	Various : Various	3.416	1.911	Jan 2022	1.455	Feb 2023	1.491	Jan 2024	-		1.491	Continuing	Continuing	-	
Subtotal			3.416	1.911		1.455		1.491		-		1.491	Continuing	Continuing	N/A	
Support (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Matrix Support	MIPR	C5ISR (RTI) : Ft. Belvoir, VA 22060	0.095	0.041	Jan 2022	0.026	Feb 2023	0.026	Dec 2023	-		0.026	Continuing	Continuing	-	
Science and Engineering Support	SS/CPFF	Johns Hopkins University : Laurel, MD	0.446	0.254	Jan 2022	0.250	Feb 2023	0.250	Jan 2024	-		0.250	Continuing	Continuing	-	
Subtotal			0.541	0.295		0.276		0.276		-		0.276	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				4.087	2.432		2.045		2.011		-		2.011	Continuing	Continuing	N/A
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023												
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)																	
2040 / 4				PE 0603774A / Night Vision Systems Advanced Development				VT8 / SOLDIER PRECISION TARGETING DEVICES - ADV DEV																	
Event Name		FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027			FY 2028					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Precision Pointing and Navigation Development																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development	Project (Number/Name) VT8 / SOLDIER PRECISION TARGETING DEVICES - ADV DEV		
Schedule Details				
Events	Start	End		
Precision Pointing and Navigation Development	Quarter 3	Year 2020	Quarter 4	Year 2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603779A / Environmental Quality Technology - Dem/Val								
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	-	22.491	76.749	31.720	-	31.720	26.880	22.724	22.312	22.571	0.000	225.447	
035: National Defense Cntr For Enviro Excellence	-	5.125	6.661	6.204	-	6.204	6.271	6.343	6.411	6.488	0.000	43.503	
DH6: Installation Resilience	-	-	-	3.013	-	3.013	3.017	2.013	2.015	2.017	0.000	12.075	
E21: Environmental Quality Technology Dem/Val	-	17.366	70.088	22.503	-	22.503	17.592	14.368	13.886	14.066	0.000	169.869	
A. Mission Description and Budget Item Justification													
There is broad potential application for environmental quality technology (EQT) to be applied to multiple Army weapon systems and installations. However, technology must be demonstrated and validated (total ownership cost and performance data identified) before potential users will consider exploiting it. This Program Element (PE) includes Projects focused on validating the general military utility or cost reduction potential of technology when applied to different types of infrastructure, military equipment or techniques. It may include validations and proof-of-principle demonstrations in field exercises to evaluate upgrades or provide new operational capabilities. The validation of technologies will be in as realistic an operating environment as possible to assess performance or cost reduction potential. EQT demonstration/validation is systemic and applicable across Department of Army sites and installation problems (e.g. unexploded ordnance detection and discrimination). This PE supports the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment. All work is endorsed by potential users and supported by a state-of-the-art assessment to determine when the technology can transition to the user for implementation.													
B. Program Change Summary (\$ in Millions)					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total				
Previous President's Budget					22.921	31.249	25.335	-	25.335				
Current President's Budget					22.491	76.749	31.720	-	31.720				
Total Adjustments					-0.430	45.500	6.385	-	6.385				
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-				
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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022
Project: E21: <i>Environmental Quality Technology Dem/Val</i>		FY 2023
Congressional Add: <i>Program Increase - Wire-Arc Additive Manufacturing (DEVCOM)</i>	5.000	20.000
Congressional Add: <i>Program Increase - Friction Stir Additive Manufacturing (DEVCOM)</i>	-	15.000
Congressional Add: <i>Program increase - Biopolymers for military infrastructure</i>	3.000	3.000
Congressional Add: <i>Program increase - Underwater cut and capture</i>	3.000	7.500
	Congressional Add Subtotals for Project: E21	11.000
	Congressional Add Totals for all Projects	11.000
		45.500
		45.500
Change Summary Explanation		
Funding increase reflects planned efforts to support installation resilience.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603779A / Environmental Quality Technology - Dem/Val				035 / National Defense Cntr For Enviro Excellence				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
035: National Defense Cntr For Enviro Excellence	-	5.125	6.661	6.204	-	6.204	6.271	6.343	6.411	6.488	0.000	43.503	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The National Defense Center for Environmental Excellence (NDCEE) was established by Congress in 1990 with a directive to "serve as a national leadership organization to address high priority environmental problems for the Department of Defense (DoD), other government organizations, and the industrial community." In May 2008, the Program was re-designated from the National Defense Center for Environmental Excellence to the National Defense Center for Energy and Environment to ensure that the Center's mission recognizes and addresses the strategic interdependence of energy and environmental technology requirements within an overall sustainability framework in support of our installations, weapons systems and war fighters. This name change also directly supports the DoD's proactive implementation of Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management." The NDCEE Program has evolved into a national resource for demonstrating, validating and transitioning innovative Environmental, Safety & Occupational Health and Energy (ESOHE) technologies. This Program is managed by the Army on behalf of the Assistant Secretary of Defense for Sustainment.

The United States (U.S.) Army's broadly encompassing and growing mobile, personal and stationary technological requirements include: infrastructure, alternative and synthetic energy, training lands, emerging contaminates, transportation, systems integration, personnel well-being, and others. Further, to train as we fight, validated ESOHE technologies need to be available and implemented at Army installations. The NDCEE will continue to demonstrate, validate, and transfer these technologies supporting our integrated environment, energy, safety, occupational health and energy objectives to enable mission, readiness, innovation, lethality and modernization to ensure our Soldiers maintain a technological advantage over our adversaries.

B. Accomplishments/Planned Programs (\$ in Millions)

Title	FY 2022	FY 2023	FY 2024
Description: NDCEE supports the demonstration and validation of mature (BA4) environment, safety, occupational health, and energy technologies that support the mission requirements. The objective is to invest in innovative technologies that support military mission/readiness, employ a high degree of technical fidelity, have a high potential for transition success, and align with modernization goals.	4.751	5.116	4.640
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
2040 / 4	PE 0603779A / Environmental Quality Technology - Dem/Val	035 / National Defense Cntr For Enviro Excellence		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Funding will be provided for projects selected the previous year and still require funds; projects are generally completed within two years. The NDCEE Program Management Office will coordinate the project selection process for potential FY 2023 new project starts. Technologies will be selected by the NDCEE project selection committee and approved by the NDCEE Executive Agent.				
FY 2024 Plans: Will fund the NDCEE program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, reporting, and technology transfer. Includes contracting office support for contract closeouts, travel to conduct program management oversight, and program coordination and education to DoD stakeholders.				
FY 2023 to FY 2024 Increase/Decrease Statement: Decreased based of annual cost adjustments				
Title: NDCEE Government program management during contract negotiations and during project formulation, execution, and technology transfer.		0.374	1.308	1.564
Description: Funds the NDCEE Government program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, and technology transition.				
FY 2023 Plans: Will fund the NDCEE program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, reporting, and technology transfer. Includes contracting office support for contract closeouts, travel to conduct program management oversight, and program coordination and education to DoD stakeholders.				
FY 2024 Plans: Will fund the NDCEE program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, reporting, and technology transfer. Includes contracting office support for contract closeouts, travel to conduct program management oversight, and program coordination and education to DoD stakeholders.				
FY 2023 to FY 2024 Increase/Decrease Statement: Increased based of annual cost adjustments				
Title: SBIR/STTR Transfer		-	0.237	-
Description: Funding transferred in accordance with Title 15 USC §638				
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638				
FY 2023 to FY 2024 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val	Project (Number/Name) 035 / National Defense Cntr For Enviro Excellence	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC §638		FY 2022	FY 2023
		Accomplishments/Planned Programs Subtotals	5.125
			6.661
			6.204
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy The NDCEE is a national asset focused on DoD applications that include technology transfer to appropriate DoD transition partners. The management strategy for the NDCEE ensures that all projects have a potential multi-service benefit and have a high potential for transition success. At the strategic level, the NDCEE Executive Advisory Board (EAB) is chaired by the DoD NDCEE Lead Agent on behalf of the Assistant Secretary of Defense for Sustainment and is representative of the services and DoD. The EAB and the Program Director are supported by the NDCEE Technical Advisory Group (TAG) to help ensure that NDCEE investments are maximized across DoD and the Services. At the tactical level, the three Focus Groups (environment, safety/occupational health, and energy) cultivate and recommend priority projects to the TAG and Project Selection Committee for funding. Transition Partners ensure that NDCEE's investments are carried forward in the next phases of the Research Development Test and Evaluation process, as identified in each funded project's Technology Transition Agreement.			
NDCEE projects enable readiness for the Services under increasingly complex and demanding scenarios. The interdependency of national security with energy supply and costs, water supply and costs, environmental resiliency, and human health and safety are clear and NDCEE projects provide forward-looking solutions to these challenges. Failure to further fund and validate promising technologies that are at the mature or Commercial-off-the-Shelf stage, would result in lost modernization opportunities and validation before they go into a military environment. These initiatives need to be carried forward into an operational/realistic testing environment so that they can support mission readiness and training when ultimately fielded to the Services.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity						R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val						Project (Number/Name) 035 / National Defense Cntr For Enviro Excellence			
Management Services (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	AEC : San Antonio, TX	25.433	0.374	Nov 2022	1.308	Oct 2022	1.564		-		1.564	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	Various : Various	3.000	-		0.237		-		-		-	0.000	3.237	-
Subtotal		28.433	0.374		1.545		1.564		-			1.564	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Testing and Evaluation	Various	Various : Various	51.223	4.751	Jan 2023	5.116	Oct 2022	4.640	Oct 2022	-		4.640	Continuing	Continuing	Continuing
Subtotal		51.223	4.751		5.116		4.640		-			4.640	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			79.656	5.125		6.661		6.204		-		6.204	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603779A / Environmental Quality Technology - Dem/Val				035 / National Defense Cntr For Enviro Excellence									
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NDCEE Management and Operations (Enduring)																	
NDCEE Env, Safety, Occ Health, and Energy Technology Dem...																	

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Tech nology - Dem/Val	Project (Number/Name) 035 / National Defense Cntr For Enviro Excellence	
Schedule Details			
Events	Start Quarter	End Year	
NDCEE Management and Operations (Enduring)	1	2019	4
NDCEE Env, Safety, Occ Health, and Energy Technology Dem/Val (Enduring)	1	2019	4

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val				Project (Number/Name) DH6 / Installation Resilience			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DH6: Installation Resilience	-	-	-	3.013	-	3.013	3.017	2.013	2.015	2.017	0.000	12.075
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 Installation Resilience is a new start within the Environmental Quality Technology - Dem/Val program in FY 2024.
 In Fiscal Year (FY) 2024, this Project is a New Start.

A. Mission Description and Budget Item Justification
 This Project demonstrates and validates technologies to advance resiliency across Army installations, improving operations management, increasing efficient energy practices, and enhancing Army infrastructure. This Project demonstrates systems and tools which aim to better inform installation manager decisions on operational planning, management of facilities, and associated infrastructure components. This research will integrate developing technologies to provide the Army with new capabilities, decreased cost, and enhanced operations for resilient installations. This effort will streamline operations of critical infrastructure components and optimize developing systems to support Army objectives and provide actionable information to the user community.

The cited work is consistent with the Army Installations Strategy and the Army Climate Strategy.

Work in this Project is performed by the United States Army Engineer Research and Development Center.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: Installation Composting for Land Resilience Description: This effort will evaluate current compost operations for Best Management Practices and demonstrate efficacy for Army installations to operate compost systems to reduce Army cost associated with disposal of solid waste, enabling installations to have a set of tools and procedures unique to their environment. FY 2024 Plans: Will validate best management practices from current on-post compost operations and create standard operating procedures for other installations to follow; will begin validation of degradation of two compostable materials. FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase reflects planned initiation of this effort in FY24.	-	-	3.013
Accomplishments/Planned Programs Subtotals	-	-	3.013

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val	Project (Number/Name) DH6 / Installation Resilience
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val				Project (Number/Name) DH6 / Installation Resilience								
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Installation Composting for Land Resilience	MIPR	Varies : Varies	-	-		-		3.013		-		3.013	0.000	3.013	-	
Subtotal				-	-	-		3.013		-		3.013	0.000	3.013	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				-	-	-		3.013		-		3.013	0.000	3.013	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023															
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Tech nology - Dem/Val				Project (Number/Name) DH6 / Installation Resilience																					
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Installation Composting for Land Resilience Demonstratio...																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Tech nology - Dem/Val	Project (Number/Name) DH6 / Installation Resilience		
Schedule Details				
Events	Start	End		
Installation Composting for Land Resilience Demonstration and Validation	Quarter 1	Year 2024	Quarter 4	Year 2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603779A / Environmental Quality Technology - Dem/Val				E21 / Environmental Quality Technology Dem/Val				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
E21: Environmental Quality Technology Dem/Val	-	17.366	70.088	22.503	-	22.503	17.592	14.368	13.886	14.066	0.000	169.869	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project supports Advanced Component Development and Prototypes of innovative environmental quality technologies that modernize materials and processes required for current and future operational sustainment and warfighter training capabilities. The Project showcases technologies that increase life safety, reduce Soldier and worker human health risks, enhance readiness and enable mission capabilities of the current and future force with a focus on eliminating the high priority issues associated with global warming, hexavalent chromium, cadmium and airborne lead through material substitution. The Project expedites technology transition from the laboratory to operational use by demonstrating modern materials and processes to fulfill or surpass the performance requirements outlined in Material Specifications, Depot Maintenance Work Requirements, Technical Manuals, Drawings and other technical data. Forward-looking materials and processes demonstrated under this project support the Cross Functional Teams and the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment. Modernized materials and processes have the additional benefit of reducing the impacts due to climate change, future regulatory compliance and cleanup requirements while simultaneously increasing performance and standardization across the Army, resulting in significantly reduced life cycle costs incurred by acquisition, industrial base and installation end users.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Environmental quality technology demonstration and validation: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems (DEVCOM)

Description: Increase operational readiness and reduce Soldier and worker human health risks by reducing or eliminating the use of cancer-causing hexavalent chromium, cadmium and associated toxic materials used in surface finishing processes for the current and future force. These Safer Alternatives for Readiness (SAFR) technologies will be used to provide superior corrosion and wear protection for components used on Future Vertical Lift and Next Generation Combat Vehicles and enable increased performance/extended barrel life for Long Range Precision Fire systems.

FY 2023 Plans:

Demonstrate mixed mating of zinc-nickel and cadmium plated electrical connectors; conduct testing to enable modernization of surface finishing and electroplating processes to support next generation clean manufacturing technologies.

FY 2024 Plans:

Will demonstrate hybrid/wire arc additive manufacturing processes for manufacturing of large parts; will demonstrate hexavalent chromium-free post treatment sealers for zinc, zinc nickel, and aluminum anodize.

FY 2023 to FY 2024 Increase/Decrease Statement:

	FY 2022	FY 2023	FY 2024
	2.286	2.453	1.445

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val	Project (Number/Name) E21 / Environmental Quality Technology Dem/Val		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY24 decrease reflects planned lifecycle for this effort.				
Title: Environmental quality technology demonstration and validation: Airborne Lead Reduction from Army Weapon Systems (DEVCOM)		2.326	3.965	2.591
Description: Sustain Soldier training readiness, maintain/restore training capability at ranges closed due to dangerous levels of lead exposure and increase life safety and protection of human health on Army installations by reducing or eliminating the use of toxic lead compounds - which are known to cause damage to central nervous, cardiovascular and immune systems with long-term effects for children, as well as potential developmental impacts, including IQ loss, behavioral issues and hearing loss - in rocket and missile propellants and primary explosives (primers/detonators/initiators) for the current and future force. These Safer Alternatives for Readiness (SAFR) will provide a domestic, readily available source for lead-free primary explosives used in all Long Range Precision Fires and Soldier Lethality systems.				
FY 2023 Plans: Demonstrate a lead-free primer in medium caliber ammunition; support pilot production, static and ground flight test for lead-free extruded rocket motor.				
FY 2024 Plans: Will demonstrate alternatives to lead thiocyanate and antimony sulfide in primers; will support automated pilot scale production of lead-free primer/detonator formulations.				
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease reflects planned lifecycle for this effort.				
Title: Environmental quality technology demonstration and validation: Low Global Warming Potential (LGWP) Alternatives to Ozone Depleting Substances (ODS) (DEVCOM)		0.221	0.264	0.156
Description: Evaluate low GWP ODS alternatives being developed by industry to assess their toxicity and flammability hazards and verify their acceptability in military unique refrigeration and fire suppression applications. These Safer Alternatives for Readiness (SAFR) technologies will support all Future Vertical Lift and Next Generation Combat Vehicle systems.				
FY 2023 Plans: Demonstrate alternative, low/no GWP refrigerant agents with high potential to meet safety and performance requirements for next generation mobile air conditioning systems.				
FY 2024 Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Tech nology - Dem/Val	Project (Number/Name) E21 / Environmental Quality Technology Dem/Val		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Will demonstrate secondary loop system to safely incorporate HFO-1234yf as an alternative low GWP refrigerant into mobile air conditioning units away from crew-occupied spaces; will demonstrate alternative, low/no GWP refrigerants for use in next generation refrigeration units for Multi-Temperature Refrigerated Container Systems (MTRCS).				
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease reflects planned lifecycle for this effort.				
Title: SBIR/STTR Transfer (DEVCOM)		-	0.897	-
Description: Funding transferred in accordance with Title 15 USC §638				
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638				
Title: Environmental quality technology demonstration and validation: Environmental Toolkit for Expeditionary Operations (USACE)		0.539	-	-
Description: Conduct pilot-scale demonstration and validation studies to determine the effectiveness of basic technologies/ methods developed for rapidly collecting environmental data in the field for the purposes of reducing impact of environmental requirements on installations. Demonstrate the ability of ETEO software to communicate easily with new, commercially available sensors through simple device driver (with minimal or no development). Assess available chemical databases on the new sensor for their ability to detect and quantify environmental contaminants. Demonstrate the operational ETEO software and sensors at designated locations.				
Title: Decontamination Effluent Treatment System (DETS) Demonstration/Validation (USACE)		0.594	-	-
Description: Demonstrate and validate the Decontamination Effluent Treatment System (DETS), an optimized scalable system for the treatment of Chemical, Biological, Radioactive, & Nuclear (CBRN) decontamination wastewater, while exploring enhancements to improve performance.				
Title: Engineered Technologies for Risk Mitigation and Management of Perfluorooctane Sulfonate and Perfluorooctanoic Acid (PFOS/PFOA) on Army Installations (USACE)		0.400	3.323	2.607
Description: Demonstrate and validate technologies such as 3D printed composite structures and advanced materials for remediation and monitoring of PFAS, novel methods for PFAS destruction, rapid risk -based classification and characterization computational models, and monitoring and extraction technologies including PFAS sensors.				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val	Project (Number/Name) E21 / Environmental Quality Technology Dem/Val	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
FY 2023 Plans: Will validate PFAS Effluent Treatment System (PETS) to decontaminate existing PFAS contaminated fire suppression infrastructure and begin demonstration of capabilities such as Thermal Desorption, Soil Washing (Multiple Technologies) to effectively remove PFOS/PFOA contamination in a variety of matrices. Will Demonstrate PFOS/PFOA removal technologies across a variety of matrices comparing removal efficiency, cost balance, regulatory guidelines and limits of detection.			
FY 2024 Plans: Will down select and validate emerging technologies demonstrated in prior year to be efficient and scalable for removal of PFOS/PFOA contamination, technologies may include Thermal Desorption, Soil Washing (Multiple Technologies). Validation of selected PFOS/PFOA removal technologies across a variety of matrices comparing removal efficiency, cost balance, regulatory guidelines and limits of detection.			
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease funding change reflects the planned lifecycle for this effort to enable validation of multiple technologies (3-4) down selected from prior year demonstration.			
Title: Carbon Sequestration Toolkit for DoD Lands (USACE) Description: Demonstrate and validate a comprehensive secure web-based toolkit for maximized carbon storage and management across the DOD landscape.		-	5.166
FY 2023 Plans: Will demonstrate visualization model for carbon sequestration potential across DoD installation lands using spatial data, high-resolution data inputs, and terrain and soil analytics.			3.106
FY 2024 Plans: Will evaluate model accuracy and precision by incorporating higher temporal and spatial resolution imagery and improved terrain and soil analytics.			
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease funding change reflects the planned lifecycle for this effort to incorporate spatial resolution imagery and improved soil analytics.			
Title: Standards for Additive Construction: Requirements, Assessment and Documentation (USACE) Description: Validate unified facility criteria and standards for additive construction of DoD infrastructure to meet structural, serviceability and resiliency requirements and evaluate the additive construction technology and materials for carbon reduction impacts.		-	2.320
			5.632

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val	Project (Number/Name) E21 / Environmental Quality Technology Dem/Val		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY 2023 Plans: Will validate specifications and requirements for additive construction by conducting materials and structural testing with focus on meeting strength, serviceability and durability requirements.				
FY 2024 Plans: Will test and evaluate Additive Construction methodologies and guidance for climate zones by characterizing material and fossil fuel usage, life-cycle assessments, and embodied energy/GHG emissions.				
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 funding increase reflects the planned lifecycle for this effort for evaluating Additive Construction methodologies.				
Title: Mitigation of GHG Emissions for DOD Construction Materials and Infrastructure (USACE) Description: Demonstrate and validate sustainable and cost-effective DoD construction materials with 50% reduction in greenhouse gas emissions.		-	6.200	5.436
FY 2023 Plans: Will evaluate drivers for embodied energy and provide action plans for criteria changes with positive quantifiable impacts on MILCON embodied energy.				
FY 2024 Plans: Will initiate and develop innovative partnerships to transfer industry technology on reduced life-cycle embodied energy, carbon capture, and carbon sequestration to meet the needs of DoD applications.				
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease funding change reflects the planned lifecycle for this effort to validate sustainable and cost-effective DoD construction materials.				
Title: Expeditionary Island Power (DEMO) Description: This effort demonstrates advanced operational energy storage technology that is interoperable with current and future Army, Joint and partner energy generation systems that support installations and contingency locations, streamlines the energy infrastructure, increases renewable energy, reduces fuel and logistics demand, and optimizes operational energy storage.		-	-	1.530
FY 2024 Plans: Will demonstrate a secondary distribution center with microgrid at Ft Leonard Wood with the Army Prime Power School.				
FY 2023 to FY 2024 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army							Date: March 2023					
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val			Project (Number/Name) E21 / Environmental Quality Technology Dem/Val						
B. Accomplishments/Planned Programs (\$ in Millions) Initiate efforts for evaluating power efficiencies and reduction GHG emissions.						FY 2022 FY 2023 FY 2024						
			Accomplishments/Planned Programs Subtotals			6.366 24.588 22.503						
							FY 2022	FY 2023				
Congressional Add: Program Increase - Wire-Arc Additive Manufacturing (DEVCOM)							5.000	20.000				
FY 2022 Accomplishments: Congressional Interest Item												
FY 2023 Plans: Congressional Interest Item												
Congressional Add: Program Increase - Friction Stir Additive Manufacturing (DEVCOM)							-	15.000				
FY 2023 Plans: Congressional Interest Item												
Congressional Add: Program increase - Biopolymers for military infrastructure							3.000	3.000				
FY 2022 Accomplishments: Congressional Interest Item funding provided for soil strengthening technologies in uncontrolled environments.												
FY 2023 Plans: Congressional Interest Item funding for soil strengthening technologies in uncontrolled environments.												
Congressional Add: Program increase - Underwater cut and capture							3.000	7.500				
FY 2022 Accomplishments: Congressional Interest Item funding provided for high-pressure waterjet cut and capture technology.												
FY 2023 Plans: Congressional Interest Item funding for high-pressure waterjet cut and capture technology.												
Congressional Adds Subtotals							11.000	45.500				
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	Cost To						
• 06I: Environmental Quality Technology Support	0.428	0.491	Base 0.307	OCO -	Total 0.307	FY 2025 -	FY 2026 -	FY 2027 -	FY 2028 -			
Remarks						Complete 0.000	Total Cost 1.226					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>
D. Acquisition Strategy The project ultimately transitions successfully demonstrated environmental quality technologies to Army acquisition, industrial base and installation end users. All technology efforts address environmental requirements identified by the Army acquisition, industrial base and installation user communities. Efforts approved by senior Army environmental leadership receive Advanced Component Development and Prototype funding to fully demonstrate and validate the technology for transition to end users for follow on implementation.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val				Project (Number/Name) E21 / Environmental Quality Technology Dem/Val							
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Conduct Demonstrations	MIPR	Varies : Varies	62.361	6.366	Oct 2021	24.588	Oct 2022	22.503	Oct 2023	-		22.503	Continuing	Continuing	Continuing
Program Increase - Wire Arc Additive Manufacturing (DEVCOM)	TBD	TBD : TBD	-	11.000	Apr 2022	20.000	Feb 2023	-		-		-	0.000	31.000	-
Program Increase - Friction Stir Additive Manufacturing (CEVCOM)	TBD	TBD : TBD	-	-		15.000	Feb 2023	-		-		-	0.000	15.000	-
Program increase - Underwater cut and capture	TBD	TBD : TBD	-	-		7.500		-		-		-	0.000	7.500	-
Program increase - Biopolymers for military infrastructure	TBD	TBD : TBD	-	-		3.000		-		-		-	0.000	3.000	-
Subtotal		62.361	17.366		70.088		22.503		-	22.503	Continuing	Continuing	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			62.361	17.366		70.088		22.503		-	22.503	Continuing	Continuing	N/A	
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)												
2040 / 4				PE 0603779A / Environmental Quality Technology - Dem/Val				E21 / Environmental Quality Technology Dem/Val												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		FY 2028		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Toxic Metals Reduction Demonstration/Validation																				
Airborne Lead Reduction Demonstration/Validation																				
Insensitive Munitions (IM) Wastewater Treatment																				
Environmental Toolkit for Expeditionary Operations																				
Low Global Warming Potential Dem/Val																				
Carbon Sequestration Toolkit for DoD Lands																				
Standards for Additive Construction: Requirements, Asses...																				
Mitigation of GHG Emissions for DOD Construction Materia...																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val	Project (Number/Name) E21 / Environmental Quality Technology Dem/Val

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Toxic Metals Reduction Demonstration/Validation	1	2015	4	2024
Airborne Lead Reduction Demonstration/Validation	1	2015	4	2024
Insensitive Munitions (IM) Wastewater Treatment	1	2019	4	2022
Fate and Risk Evaluation System for Contaminants	1	2020	4	2021
Environmental Toolkit for Expeditionary Operations	1	2020	4	2022
Low Global Warming Potential Dem/Val	1	2019	4	2024
Carbon Sequestration Toolkit for DoD Lands	1	2023	4	2027
Standards for Additive Construction: Requirements, Assessment and Documentation	1	2023	4	2027
Mitigation of GHG Emissions for DOD Construction Materials and Infrastructure	1	2023	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603790A / NATO Research and Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	3.639	3.805	4.143	-	4.143	4.176	4.234	4.315	4.360	0.000	28.672
691: NATO Rsch & Devel	-	3.639	3.805	4.143	-	4.143	4.176	4.234	4.315	4.360	0.000	28.672
A. Mission Description and Budget Item Justification												
This Project implements the provisions of Title 10 United States (U.S.) Code, Section 2350a, Cooperative Research and Development (R&D) Projects: Allied Countries. The objective is to improve, through the application of emerging technologies, the conventional defense capabilities of the U.S. and our cooperative partners, including the North Atlantic Treaty Organization (NATO), U.S. major non-NATO allies and Friendly Foreign countries through technology sharing and joint equipment development, thereby reducing U.S. acquisition costs. Cooperative efforts also improve multinational force compatibility with potential coalition partners through the development and use of similar equipment and improved interfaces. The Project focuses specifically on international cooperative technology demonstration, validation, and interoperability of Army weapon and command, control, communications and information (C3I) systems, including the NATO Defense Against Terrorism initiatives. Activities are implemented through international agreements with foreign partners that define scope, cost and work sharing arrangements, management, contracting, security, data protection and third party transfers. Funds are used to pay for only the U.S. work share that occurs in the United States at U.S. Government and U.S. contractor facilities.												
B. Program Change Summary (\$ in Millions)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total				
Previous President's Budget				3.777	3.805	3.875	-	-	3.875			
Current President's Budget				3.639	3.805	4.143	-	-	4.143			
Total Adjustments				-0.138	0.000	0.268	-	-	0.268			
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 				-	-	-	-	-				
				-	-	-	-	-				
				-0.138	-	-	-	-				
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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development				Project (Number/Name) 691 / NATO Rsch & Devel			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
691: NATO Rsch & Devel	-	3.639	3.805	4.143	-	4.143	4.176	4.234	4.315	4.360	0.000	28.672
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project implements the provisions of Title 10 United States (U.S.) Code, Section 2350a, Cooperative Research and Development (R&D) Projects: Allied Countries. The objective is to improve, through the application of emerging technologies, the conventional defense capabilities of the U.S. and our cooperative partners, including the North Atlantic Treaty Organization (NATO), U.S. major non-NATO allies and Friendly Foreign countries through technology sharing and joint equipment development, thereby reducing U.S. acquisition costs. Cooperative efforts also improve multinational force compatibility with potential coalition partners through the development and use of similar equipment and improved interfaces. The Project focuses specifically on international cooperative technology demonstration, validation, and interoperability of Army weapon and command, control, communications and information (C3I) systems, including the NATO Defense Against Terrorism initiatives. Activities are implemented through international agreements with foreign partners that define scope, cost and work sharing arrangements, management, contracting, security, data protection and third party transfers. Funds are used to pay for only the U.S. work share that occurs in the United States at U.S. Government and U.S. contractor facilities.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: Armaments Cooperation Enterprise Support	2.486	2.696	2.966
Description: Armaments Cooperation Enterprise Support/ International Online (IOL) Development and Implementation NATO/ International Cooperative R&D (AR 70-41) and International Acquisition (AR 70-1, AR 70-3).			
The goal of this activity is to expand worldwide allied standardization and interoperability through cooperative Research and Development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. The execution AR 70-41 responsibilities requires DASA (DE&C) to conduct engagement with key strategy foreign partners in all regions of the world through the SNR(A) program, international agreement negotiations, and other bilateral and multilateral forums involving DASA (DE&C) personnel. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the NATO Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding.			
FY 2023 Plans: Supports 9 Contractor Manpower Equivalents (CME) with Armaments Cooperation Support with munitions, weapons, aviation and armaments.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel	
B. Accomplishments/Planned Programs (\$ in Millions) Supports 9 CMEs with Armaments Cooperation Support with munitions, weapons, aviation and armaments.		FY 2022	FY 2023
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is based on increased requirements and economic assumptions.			
Title: Communications Interoperability, and Electronics Technologies Description: The goal of this activity is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leveraged national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, Joint Tactical Radio (JTRS), Combat Identification, and Multilateral Interoperability Program.	0.266	0.273	0.299
FY 2023 Plans: Include efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.			
FY 2024 Plans: Include efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is based on increased requirements and economic assumptions.			
Title: Senior National Representatives (Army) (SNR-(A)) Description: Senior National Representatives (Army) (SNR-(A)) Projects (Partners: France, Germany, United Kingdom and Italy): Supports harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and road-mapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group 6, NATO Army Armaments Group (NAAG), will provide an opportunity to observe and demonstrate the current and future capability of participating NATO nations with a view to assisting future operational and materiel interoperability. Army support of NAAG studies, analysis and technology demonstrations.	0.028	0.028	0.031
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 4	PE 0603790A / NATO Research and Development	691 / NATO Rsch & Devel	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Funds will be used to pursue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs.			
FY 2024 Plans: Funds will be used to pursue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs.			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is based on increased requirements and economic assumptions.			
Title: Weapons and Munitions Technologies Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.	0.214	0.219	0.240
FY 2023 Plans: The nations will be able to receive and provide mutual fire support (i.e. cannon and rocket fire) in combined operations more rapidly and with minimal errors			
FY 2024 Plans: The nations will be able to receive and provide mutual fire support (i.e. cannon and rocket fire) in combined operations more rapidly and with minimal errors.			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is based on increased requirements and economic assumptions.			
Title: Ground Systems Technologies Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics,	0.214	0.120	0.185

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.			
FY 2023 Plans: Funding will be used to fund the continuation of cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric Project Agreement between US and Japan.			
FY 2024 Plans: Funding will be used to fund the continuation of cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric Project Agreement between US and Japan.			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is based on increased requirements and economic assumptions.			
Title: Aviation Systems Technologies		0.431	0.331
Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.		0.422	
FY 2023 Plans: funding will be used to pursue cooperative projects (i.e., the development of advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments).			
FY 2024 Plans: Funding will be used to pursue cooperative projects (i.e., the development of advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments).			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is based on increased requirements and economic assumptions.			
Title: SBIR/STTR Transfer		-	0.138
Description: Funding transferred in accordance with Title 15 USC §638			-
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC §638 FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638.		FY 2022	FY 2023
	Accomplishments/Planned Programs Subtotals	3.639	3.805
C. Other Program Funding Summary (\$ in Millions) N/A			FY 2024 4.143
Remarks			
D. Acquisition Strategy Acquisition Strategy: The goal of this program is to expand worldwide allied standardization interoperability through cooperative research and development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. All projects are test or technical demonstrations to feed into potential new requirements in support of Army Transformation to the Future Force or as product improvements to the Current Force. List of the programs currently in place: Communications, Interoperability, and Electronics Technologies The goal of this project is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts under this project include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leverage national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes projects formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program. Aviation Systems Technologies The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. Ground Systems Technologies			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / <i>NATO Research and Development</i>	Project (Number/Name) 691 / <i>NATO Rsch & Devel</i>
The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.		
Weapons and Munitions Technologies The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.		
Armaments Cooperation Enterprise Support The goal of this program is to expand worldwide allied standardization and interoperability through cooperative research and development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. This program will also include: the United States' share of costs of the NATO Civil Budget, Chapter IX, which funds the NATO Industrial Advisory Group (NIAG) and the Special Fund for Cooperative Planning (U. S. Army is Executive Agent for this NATO bill); the Technical Cooperation Program, and Army armaments cooperation working groups with many nations.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development				Project (Number/Name) 691 / NATO Rsch & Devel								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.138		-		-		-	0.000	0.138	-	
Subtotal				-	-	0.138		-		-		-	0.000	0.138	N/A	
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Armaments Cooperation Enterprise Support	C/FFP	LSS/GDIT : Fairfax, VA	13.390	2.486		2.696		2.966		-		2.966	Continuing	Continuing	Continuing	
Communications, Interoperability, and Electronics Technologies	MIPR	Joint Tactical Radio (JTRS), JTNC, COALWNW, SPAWAR, CERDEC, ARDEC W1DF : San Diego, CA, Red Stone Arsenal	2.102	0.266		0.273		0.299		-		0.299	Continuing	Continuing	Continuing	
Aviation Systems Technologies	MIPR	RDECOM/AMRDEC : Red Stone Arsenal	1.953	0.431		0.331		0.422		-		0.422	Continuing	Continuing	Continuing	
Ground Systems Technology	MIPR	TARDEC : Various	0.478	0.214		0.120		0.185		-		0.185	Continuing	Continuing	Continuing	
Weapons and Munitions	Various	CECOM, ARDEC, AMMO, PEO C3T : Aberdeen Proving Ground, Various	2.941	0.214		0.219		0.240		-		0.240	Continuing	Continuing	Continuing	
SNR(A)	C/TBD	ARL, HQDA, JCGISR: Army : Various	2.318	0.028		0.028		0.031		-		0.031	Continuing	Continuing	Continuing	
Subtotal				23.182	3.639		3.667		4.143		-		4.143	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development				Project (Number/Name) 691 / NATO Rsch & Devel					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	23.182	3.639	3.805		4.143		-		4.143	Continuing	Continuing	N/A
Remarks												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023													
Appropriation/Budget Activity							R-1 Program Element (Number/Name)							Project (Number/Name)													
2040 / 4							PE 0603790A / NATO Research and Development							691 / NATO Rsch & Devel													
FY 2015														FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021								
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N/A																											
FY 2022														FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028								
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N/A																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel	Schedule Details	
Events N/A	Start		End	
	Quarter 1	Year 2017	Quarter 4	Year 2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603801A / Aviation - Adv Dev											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
Total Program Element	-	1,138.457	1,157.472	1,502.160	-	1,502.160	1,729.307	1,462.934	1,810.727	1,830.926	Continuing	Continuing				
B47: Future Vertical Lift	-	505.209	210.194	1,027.608	-	1,027.608	1,035.409	676.532	725.666	733.758	Continuing	Continuing				
CK7: FARA Ecosystem	-	21.183	22.748	29.151	-	29.151	30.033	30.975	31.305	31.655	0.000	197.050				
CS7: FLRAA MTA	-	-	478.441	16.536	-	16.536	6.746	-	-	-	0.000	501.723				
F12: Future Attack Reconnaissance Aircraft	-	612.065	446.089	428.865	-	428.865	657.119	755.427	1,053.756	1,065.513	Continuing	Continuing				

A. Mission Description and Budget Item Justification

This funding line directly aligns to the Future Vertical Lift (FVL) Army modernization priority. Future Vertical Lift (FVL) is an initiative to develop a family of vertical lift aircraft for the United States Armed Forces. The Department of Defense (DOD) established FVL to focus vertical lift capabilities and technology development as well as retain long-term industrial base capabilities. The Deputy Secretary of Defense issued the FVL Strategic Plan in 2012 to outline a joint approach for the next generation vertical lift aircraft for all military services. The Strategic Plan provided a foundation for replacing the current fleet with advanced capability by shaping the development of vertical lift aircraft for the next 25 to 40 years. In Fiscal Year (FY) 2017, the Army identified FVL as one of the Army's six modernization priorities, and established the FVL Cross Functional Team (CFT). The FVL objectives are increased vertical lift maneuverability, range, speed, payload, survivability, and reliability while reducing the logistics footprint. This capability will provide critical vertical lift aviation capability in multi-domain operations to the joint warfighter and maneuver force.

The Future Long Range Assault Aircraft (FLRAA) program pursues FVL Capability Set 3 (CS3) and provides Combatant Commanders with deterrence, power projection, and tactical capabilities at operational and strategic distances. The Army competitively awarded the weapon system development contract in December 2022, using a hybrid acquisition approach. The contract award initiates the Rapid Prototyping effort to execute a preliminary design and development of FLRAA Virtual Prototypes, using Middle Tier of Acquisition (MTA) authorities.

The total estimated cost of the FLRAA Middle Tier of Acquisition effort is \$622 million RDT&E from FY22 to FY25. FLRAA MTA is fully funded across the Future Years Defense Program.

The Future Attack Reconnaissance Aircraft (FARA) Capability Set 1 (CS1) is a critical Army Aviation priority and will restore attack/reconnaissance dominance by mitigating enemy long-range capabilities by creating lethal effects from outside enemy sensor/weapons range and allowing joint force commanders to maneuver from relative sanctuary.

Both FLRAA and FARA variants will integrate advanced technologies, using a modular open systems approach, and design configurations with appropriate trades to ensure affordability.

This resourcing funds both FLRAA and FARA.

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Change Summary Explanation

Increase in FY 2024 funding from PB23 to PB24 is in support of FLRAA detailed design and building developmental prototype aircraft.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) B47 / Future Vertical Lift				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
B47: Future Vertical Lift	-	505.209	210.194	1,027.608	-	1,027.608	1,035.409	676.532	725.666	733.758	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The Future Vertical Lift (FVL) Project's funding provides for the development of a Future Long Range Assault Aircraft (FLRAA) Capability Set Three weapon system within the FVL family of systems. FLRAA will conduct air assault, urban assault/security, maritime interdiction, medical evacuation, humanitarian assistance/disaster relief, tactical resupply, direct action, noncombatant evacuation operation, and combat search and rescue operations. FLRAA will support the Army, including Special Operations Command (USSOCOM) and the Joint Force, in a contested, near peer threat environment. The FLRAA weapon system will retain the Army's ability to project combat power with transformational increases in range, speed, mobility, and payload over current Army and USSOCOM aircraft.

FLRAA achieved a Materiel Development Decision approval in October 2016 and the Office of Secretary of Defense granted a sufficiency determination of the Analysis of Alternatives (AoA) in July 2019.

The Fiscal Year (FY) 2024 budget request funds continued subsystem risk reduction activities, the initiation of the of the FLRAA weapon system detailed design, continued development of a digital backbone architected to meet Modular Open System Approach (MOSA) objectives, and the initiation of developmental prototype assembly and integration for qualification and test.

The total estimated cost of the FLRAA Middle Tier of Acquisition effort is \$622 million RDT&E from FY22 to FY25. FLRAA MTA is fully funded across the Future Years Defense Program.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Engineering Services / Research Studies	FY 2022	FY 2023	FY 2024
Description: Provide engineering research, planning, modeling, and analysis. Support the execution of subsystem risk reduction efforts through the FLRAA Weapon System Development (WSD) contract to continue definition and documentation of subsystem designs as required to inform the system level design and support the FLRAA acquisition schedule. Continue maturation of Model Based System Engineering (MBSE) competencies, infrastructure, and model development used to describe system requirements and design. Continue maturation of Open System Architecture (OSA) standards, processes, and requirements through enterprise-wide collaboration to support a Modular Open System Approach (MOSA) to include definition of system architecture requirements, development of component specification models, and component definition models. Conduct independent cyber and safety analyses. Provide critical airworthiness support to enable the development of the FLRAA Airworthiness Qualification Strategy (AQS). Develop statutory and regulatory Milestone B documentation through Integrated Product Teams (IPT) and working group collaboration.	370.630	44.574	52.315

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
FY 2023 Plans: Support engineering changes associated with refined requirements, continue studies and analyses to refine MOSA architectures, further enable MBSE in the Digital Environment, and develop Milestone B documentation.					
FY 2024 Plans: Support engineering changes associated with refined requirements, review contract deliverables associated with subsystem risk reduction activities and weapon system detailed designs to ensure compliance with technical specifications and airworthiness requirements, continue studies and analyses to refine and implement Open System Architectures (OSA), further enable MBSE in the digital environment, prepare for the FLRAA Weapons System Critical Design Review (CDR), and support the completion and coordination of a FLRAA Milestone B decision.					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase in funding is attributable to the increased technical workload and airworthiness support required to manage the execution of subsystem risk reduction activities, FLRAA weapon system detailed design work, and initiation of prototype manufacturing activities on the FLRAA weapon system development contract.					
Title: Program Management Description: Oversight and management of the FLRAA acquisition program. Program analysis of affordability, program performance, and schedule to ensure support of the Army mission. Guide, direct and manage program efforts through development phases of the lifecycle.			10.933	6.461	6.602
FY 2023 Plans: Manage the execution of the Weapon System Development Contract and support efforts to achieve Milestone B Decision.					
FY 2024 Plans: Continue to manage the rigorous execution of programmatic, technical, logistics, business and administrative requirements to execute the scope of the FLRAA Engineering and Manufacturing Development acquisition phase, continue to provide critical information technology infrastructure to enable a distributed workforce, and continue to support Aviation enterprise-wide initiatives to facilitate common Modular Open Systems Approach objectives.					
FY 2023 to FY 2024 Increase/Decrease Statement: Minor increase due to economic assumptions					
Title: Supportability Analysis and Acquisition Support Description: Acquisition and supportability research, planning, modeling, analysis, documentation and reviews supporting the FLRAA acquisition program. Early design influence analysis to assess operational durability; emphasizing digital data thread,			3.153	5.448	9.851

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
active health state awareness in Condition Based Maintenance (CBM+), and optimized human system interface for ease of operations and maintenance.					
FY 2023 Plans: Continue integration of supportability modeling and analysis in direct support of Weapon System Development execution and supporting Milestone B decision, and operationalize the sustainment vision using a digital thread across the life cycle including design, build, and maintenance phases of the weapons system life cycle.					
FY 2024 Plans: Initiate the start of extensive provisioning planning to include provisioning coordination activities, demonstrations, and coordination with Soldiers to identify and discuss Soldier touch points to ensure and operable and maintainable weapon system solution. Continue integration of supportability modeling and analysis in direct support of Weapon System Development execution to also include operation support cost refinement via depot source of repair and level of repair analysis.					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to the initiation of enterprise supportability and analysis studies, the additional product support workload associated with conducting analysis and preparing documentation required for Milestone B, and executing the EMD phase of the FLRAA program.					
Title: Middle Tier Acquisition (MTA) Preliminary Design and Virtual Prototype Rapid Prototyping		42.993	-	-	-
Description: The Preliminary Design and MTA Virtual Prototype Rapid Prototyping effort is executed under the Weapon System Development Base contract scoped to complete the system preliminary design and develop two FLRAA virtual prototypes consisting of a FLRAA Vehicle Dynamics Model (VDM) and a FLRAA Portable Crewstation (FPC) to support system and subsystem analysis and testing. This includes the development and acquisition of GFE hardware and software in support of the FLRAA MTA efforts.					
Title: Prototype Material and Manufacturing Development		-	146.039	958.840	
Description: Purchasing materials, including the development and acquisition of GFE hardware and software necessary to meet FLRAA prototype materials, execution of subsystem risk reduction activities, and execution of the EMD phase of the FLRAA program, including weapon system detailed design and prototype manufacturing efforts.					
FY 2023 Plans: Initiate subsystem risk reduction engineering efforts, purchase long lead material required to meet developmental prototype delivery schedule, and continue to develop and purchase GFE hardware required for prototype integration.					
FY 2024 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023										
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev			Project (Number/Name) B47 / Future Vertical Lift															
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024								
Complete subsystem risk reduction efforts, begin weapon system detail design preparing for the Critical Design Review, begin building FLRAA EMD prototypes one through six, continue maturing and purchasing GFE for prototype integration and developmental testing, and continue to mature critical enabling capabilities required to meet Army modernization requirements.																					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase is due to the execution of subsystem risk reduction efforts and the exercise of the EMD Option for detailed design and prototype delivery on the FLRAA weapon system development contract.																					
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Description: SBIR/STTR amount in accordance with Title 15 USC 638.											-	7.672	-								
FY 2023 Plans: Funding transferred in accordance with Title 15 USC § 638.																					
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 funding transferred in accordance with Title 15 USC § 638.																					
Accomplishments/Planned Programs Subtotals											427.709	210.194	1,027.608								
Congressional Add: FLRAA Program Increase											FY 2022	FY 2023									
FY 2022 Accomplishments: Supported the extension of Competitive Demonstration Risk Reduction (CDRR) efforts. Executed additional risk reduction activities to further mitigate preliminary design risks to include subsystem and component-level risk reduction, MOSA architecture implementation, and cybersecurity. Executed acquisition of long lead mission systems Government Furnished Equipment (GFE) required for Weapon System Development (WSD) contract efforts to further mitigate schedule risk.											77.500	-									
Congressional Adds Subtotals											77.500	-									
C. Other Program Funding Summary (\$ in Millions)																					
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost										
• A12002: Future Long Range Assault Aircraft (FLRAA)	-	-	0.000	-	0.000	-	-	571.593	613.240	Continuing	Continuing										
• CS7: FLRAA MTA	-	478.441	16.536	-	16.536	6.746	-	-	-	0.000	501.723										

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army							Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) B47 / Future Vertical Lift			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Remarks											
Program Element 0603465A Future Vertical Lift Advanced Technology includes Joint Multi-Role Technology Demonstration (JMR-TD); supported flying demonstrator activities providing knowledge transfer from flight test, data analysis, Soldier touch points, and risk reduction activities to the FLRAA program.											
Project CS7 includes all FLRAA MTA efforts from FY 2023 and beyond, which was initiated as a planned accomplishment under Project B47 in FY 2022.											
Project A12002 includes all FLRAA procurement funding FY 2027 and beyond.											
D. Acquisition Strategy											
The Army is executing a hybrid acquisition approach to design, develop, and deliver the FLRAA weapons system. In order to support the Army's modernization strategy and concept for multi-domain operations, the FLRAA program will deliver the first aircraft to the first unit in FY 2030, with additional aircraft in FY 2031. This hybrid approach builds on the JMR-TD efforts (started in 2013); the Army's AoA (completed in July 2019); and multiple ongoing risk mitigation efforts.											
The Army's risk mitigation activities ahead of the Weapon System Development have included: (1) additional conceptual design and flight envelope expansion tasks on the existing JMR-TD Technology Investment Agreement (TIA); (2) MOSA, FVL Architecture Collaboration Working Group (with participation from industry and academia) to establish a common architecture requirements framework for FLRAA and FARA system development; and (3) a CD&RR effort, awarded to two Project Agreement Holders (PAH), using an Aviation Missile and Technology Consortium (AMTC) Other Transaction Authority (OTA) agreements to provide substantiating technical documentation on weapon system designs, requirements decompositions, trade-studies, and requirements feasibility for the FLRAA Weapon System Development.											
These risk reduction activities have maintained industry engagement and momentum from the JMR-TD program, inform capabilities and system requirements, and provided initial trade assessments for the final operational requirements. They also informed the final acquisition strategy, mature the Government's architecture requirements development, and transition appropriate Science & Technology investments to the PoR. CD&RR Phase II incorporated efforts leading to preliminary design using a digital engineering environment. The Army competitively awarded the Weapon System Development contract in December 2022 to one vendor with a hybrid acquisition approach. This approach includes the opportunity to employ new DoDI 5000.80 (Operation of the Middle Tier of Acquisition (MTA)) authorities along with a tailored DoDI 5000.85 (Major Capability Acquisition) acquisition strategy.											
Finally, the Army is also addressing life cycle affordability, sustainability, and maintainability early in the program. The FLRAA program is employing multiple strategies including: should cost reduction opportunities, use of a digital thread from design through sustainment, and stochastic sustainment modeling. Additionally, FLRAA is one of the Army's pilot programs for life cycle intellectual property and data strategy development.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army													Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev					Project (Number/Name) B47 / Future Vertical Lift					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Various : Redstone Arsenal, AL	13.389	5.063	Dec 2021	1.784	Dec 2022	3.206	Dec 2023	-		3.206	Continuing	Continuing	Continuing
Program Management- Consolidated Support Contract	C/ FFPLOE	Smartonix, Inc. : Huntsville, AL	-	5.870	Mar 2022	4.677	Mar 2023	3.396	Mar 2024	-		3.396	Continuing	Continuing	Continuing
Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)	TBD	TBD : TBD	-	-		7.672	Sep 2023	-		-		-	0.000	7.672	-
Subtotal		13.389	10.933		14.133		6.602			6.602		6.602	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Preliminary Design and Virtual Prototype Rapid Prototyping	C/CPIF	Bell Textron Inc. : Fort Worth, TX	-	42.993	Dec 2022	-		-		-		-	0.000	42.993	-
Prototype Material - Government Furnished Equipment	Various	Various : Various/ Redstone Arsenal	-	8.379	Aug 2022	19.589	Mar 2023	13.542	Dec 2023	-		13.542	Continuing	Continuing	Continuing
EMD Subsystem Risk Reduction	C/Various	Bell Textron Inc. : Ft. Worth, TX	-	-		126.450	May 2023	431.813	Nov 2023	-		431.813	0.000	558.263	Continuing
Prototype Material and Manufacturing Development (EMD)	Option/ Various	Bell Textron Inc. : Various	-	-		-		508.421	Jun 2024	-		508.421	Continuing	Continuing	Continuing
Subtotal		-	51.372		146.039		953.776			953.776		953.776	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army													Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev					Project (Number/Name) B47 / Future Vertical Lift					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition and Supportability Analysis	Various	AMCOM ALC, CCDC AvMC : Redstone Arsenal, AL	9.583	3.153	Nov 2021	5.448	Nov 2022	7.875	Nov 2023	-		7.875	Continuing	Continuing	Continuing
Engineering Services / Research Studies - Other	MIPR	Various : Huntsville, AL	24.420	13.776	Nov 2021	16.581	Nov 2022	-		-		-	0.000	54.777	Continuing
Engineering Services/ Competitive Demonstration Risk Reduction - Other	C/CS	Advanced Technology International; Sikorsky Aircraft Corp; Bell Textron Inc : Summerville, SC; Stratford, CT; Fort Worth, TX	249.865	365.185	Nov 2021	-	-	-	-	-	-	-	0.000	615.050	-
Engineering Services / Research Studies - Organic	MIPR	Various : Redstone Arsenal, AL	12.643	25.760	Mar 2022	-	-	-	-	-	-	-	0.000	38.403	-
Engineering Services / Research Studies - Other	C/ FFPLOE	Georgia Tech Research Institute : Various	13.908	26.241	Dec 2021	-	-	-	-	-	-	-	0.000	40.149	-
Enterprise Logistics and Support Analysis	Various	Various : Redstone Arsenal, AL	-	-		-		1.976	Mar 2024	-		1.976	Continuing	Continuing	-
Engineering Services - Collaborative Efforts	MIPR	CCDC AvMC, S3I, SRD : Huntsville, AL	-	-		14.646	Jan 2023	18.207	Jan 2024	-		18.207	Continuing	Continuing	-
Engineering / Research Support Services	C/ FFPLOE	Torch Technologies : Huntsville, AL	-	-		8.875	Jan 2023	11.297	Jan 2024	-		11.297	Continuing	Continuing	-
Enterprise Common Technical Support to Programs	Various	Various : Various	-	8.789	Aug 2022	4.472	May 2023	12.841	Mar 2024	-		12.841	Continuing	Continuing	-
Enterprise Architecture Convergence and Holistic Survivability	Various	Various : Huntsville, AL	-	-		-		6.660	Mar 2024	-		6.660	Continuing	Continuing	-
Adaptive Work Environment Enabling Infrastructure and Support	Various	Various : Huntsville, AL	-	-		-		3.310	Mar 2024	-		3.310	Continuing	Continuing	-
Subtotal		310.419	442.904		50.022		62.166		-		62.166	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) B47 / Future Vertical Lift						
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test and Evaluation Support	Various	Redstone Test Center : Redstone Arsenal, AL	-	-		-		5.064	Dec 2023	-		5.064	Continuing	Continuing	Continuing
Subtotal			-	-		-		5.064		-		5.064	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			323.808	505.209		210.194		1,027.608		-		1,027.608	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023														
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) B47 / Future Vertical Lift																				
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Architecture Definition and Risk Reduction																												
Competitive Demonstration and Risk Reduction	Architecture Definition and Risk Reduction																											
Source Selection Evaluation Board	Competitive Demonstration and Risk Reduction																											
Contract Award	SSEB								Contract Award																			
Virtual Prototyping (MTA)	Virtual Prototyping								Virtual Prototyping																			
Preliminary Design (MTA) and Detail Design	Preliminary and Detail Design																											
FLRAA Virtual Prototype Deliveries (Delivered under Proj...																	Virtual Prototype Deliveries											
Prototype Builds													Prototype Build															
Prototype Deliveries																	Prototype Deliveries											
Flight Testing																	Flight Testing											

Note

The FLRAA MTA effort transitioned to Project CS7 in FY23; Virtual Prototypes are delivered under Project CS7, but will transition back to Project B47 after FLRAA MTA completion.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift	
Schedule Details			
Events	Start	End	
	Quarter	Year	Quarter
Materiel Development Decision	1	2017	1
Analysis of Alternatives	3	2017	4
System Specification Development	2	2019	3
Program Documentation and Contracts Requirements Package	2	2019	3
Architecture Definition and Risk Reduction	3	2019	4
Competitive Demonstration and Risk Reduction	2	2020	1
Request for Proposal Release	4	2021	4
Proposal Preparation	4	2021	4
Source Selection Evaluation Board	3	2021	2
Contract Award	1	2023	1
Virtual Prototyping (MTA)	1	2023	1
Preliminary Design (MTA) and Detail Design	1	2023	1
FLRAA Virtual Prototype Deliveries (Delivered under Project CS7)	4	2024	4
Prototype Builds	3	2024	3
Prototype Deliveries	2	2026	1
Flight Testing	2	2026	1
			2030

Note

Virtual Prototyping Middle Tier Acquisition (MTA) is funded in B47 for FY 2022 and realigns to Project CS7 in FY 2023.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CK7 / FARA Ecosystem				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
CK7: FARA Ecosystem	-	21.183	22.748	29.151	-	29.151	30.033	30.975	31.305	31.655	0.000	197.050	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

Note

This effort was previously funded under the Future Attack Reconnaissance Aircraft (FARA) Project F12 and has been restructured to a unique Project to better support the cross-cutting capabilities demonstrated within this Project and provide transparency in modernization efforts.

A. Mission Description and Budget Item Justification

The Future Vertical Lift (FVL) Project's funding builds upon prior demonstrations and provides for early opportunities to validate technologies and requirement concepts and to off-ramp, maintain, or accelerate investments, which enable modernization at the speed of relevance.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: FARA Ecosystems	21.183	21.918	29.151
Description: Funding for FARA Ecosystem supports prototyping demonstration with relevant technologies in a Joint All Domain Operations (JADO) environment, which will inform FVL requirements including FARA, MOSA, and Air Launched Effects (ALE) and enable timely decisions to accelerate capabilities, transition of S&T technologies. The Army's Experimental Demonstration Gateway Event (EDGE) and Project Convergence (PC) activities will garner early user feedback informing developmental efforts.			
FY 2023 Plans: Continues FVL Ecosystem prototyping demonstration activities through primary surrogate platforms with multiple technologies. Transitions available S&T items directly into prototyping and operationally relevant demonstration activities. Continues prototyping and demonstration of architecture, automation, autonomy, and interfaces (A3I), kinetic and non-kinetic effects, and sensors. Conducts Soldier touchpoints to facilitate early feedback to inform requirements and concepts.			
FY 2024 Plans: FY2024 will build upon prior demonstrations, providing for early opportunities to validate technologies and requirement concepts and to off-ramp, maintain, or accelerate investments, to enable modernization at the speed of relevance.			
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 increase to address integration activities identified from demonstrations and events.			
Title: SBIR/STTR Transfer	-	0.830	-
Description: Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) FY23 SBIR/STTR Funding transferred in accordance with Title 15 USC §638			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023						
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CK7 / FARA Ecosystem							
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2022	FY 2023	FY 2024					
FY 2023 Plans: SBIR/STTR amount in accordance with Title 15 USC 638.																
FY 2023 to FY 2024 Increase/Decrease Statement: SBIR/STTR amount in accordance with Title 15 USC 638.																
Accomplishments/Planned Programs Subtotals										21.183	22.748	29.151				
C. Other Program Funding Summary (\$ in Millions)																
Line Item	FY 2022	FY 2023	FY 2024	Base	FY 2024	OCO	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost			
• F12: Future Attack Reconnaissance Aircraft	612.065	446.089	428.865	-	428.865		657.119	755.427	1,053.756	1,065.513	Continuing	Continuing				
Remarks																
D. Acquisition Strategy																
The FVL CFT will utilize a number of U.S. Army Combat Capability Development Centers, Other Government Agencies, Test Centers, Project Management Offices and their respective procurement and scope execution instruments to execute capability demonstrations to assess the viability of technology and inform the Ecosystems requirements and concepts.																

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CK7 / FARA Ecosystem						
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.830	Sep 2023	-		-		-	0.000	0.830	-
Subtotal			-	-		0.830		-		-		-	0.000	0.830	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FARA Ecosystem Demonstration	Various	Multiple : Multiple	-	21.183	Nov 2021	21.918	Nov 2022	29.151	Nov 2023	-		29.151	Continuing	Continuing	Continuing
Subtotal			-	21.183		21.918		29.151		-		29.151	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	21.183		22.748		29.151		-		29.151	Continuing	Continuing	N/A

Remarks

PB 2024 FARA Ecosystem Demonstration funding reflects costs associated with Experimentation and Demonstration Events, and Soldier Touch-points

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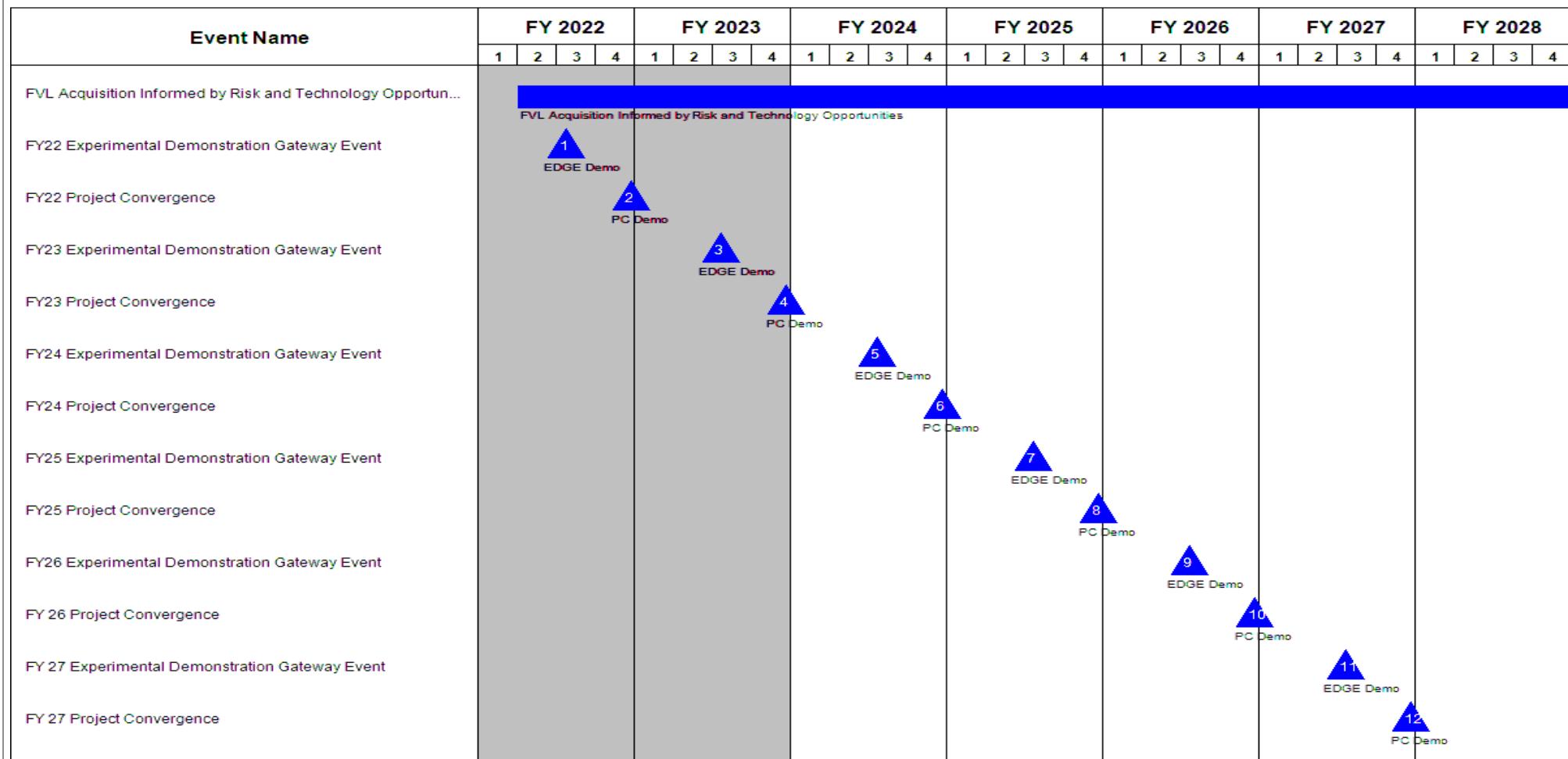
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity
2040 / 4

R-1 Program Element (Number/Name)
PE 0603801A / Aviation - Adv Dev

Project (Number/Name)
CK7 / FARA Ecosystem



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023														
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CK7 / FARA Ecosystem																				
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FY 28 Experimental Demonstration Gateway Event																												
FY 28 Project Convergence																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CK7 / FARA Ecosystem		
Schedule Details				
Events	Start	End	Quarter	Year
FVL Acquisition Informed by Risk and Technology Opportunities	2	2022	4	2028
FY22 Experimental Demonstration Gateway Event	3	2022	3	2022
FY22 Project Convergence	4	2022	4	2022
FY23 Experimental Demonstration Gateway Event	3	2023	3	2023
FY23 Project Convergence	4	2023	4	2023
FY24 Experimental Demonstration Gateway Event	3	2024	3	2024
FY24 Project Convergence	4	2024	4	2024
FY25 Experimental Demonstration Gateway Event	3	2025	3	2025
FY25 Project Convergence	4	2025	4	2025
FY26 Experimental Demonstration Gateway Event	3	2026	3	2026
FY 26 Project Convergence	4	2026	4	2026
FY 27 Experimental Demonstration Gateway Event	3	2027	3	2027
FY 27 Project Convergence	4	2027	4	2027
FY 28 Experimental Demonstration Gateway Event	3	2028	3	2028
FY 28 Project Convergence	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CS7 / FLRAA MTA				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
CS7: FLRAA MTA	-	-	478.441	16.536	-	16.536	6.746	-	-	-	0.000	501.723	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

The Army's use of Middle Tier of Acquisition (MTA) authorities for Future Long Range Assault Aircraft (FLRAA) transitions work completed during the Competitive Demonstration and Risk Reduction effort to support three priority efforts: (1) completion of the rapid prototyping for the delta Preliminary Design Review; (2) deliver two virtual prototypes including a vehicle dynamic model and portable crew station; and (3) support the requirements for Milestone B certification under 10 U.S.C. 2366b.

Funds will provide for the completion of the FLRAA weapon system preliminary design to include development of a digital backbone architecture to meet modular open system approach (MOSA) objectives. The development and delivery of two virtual prototypes will directly support early user involvement at the Air Maneuver Battle Lab (AMBL), the Combat Aviation Brigade Architecture Integration Lab (CABAIL), and also support system and subsystem analysis and testing.

The total cost of the FLRAA Middle Tier of Acquisition effort under this Project is estimated to be \$501.723 million RDT&E from FY23 to FY25. The remainder of the FLRAA MTA is fully funded across the Future Years Defense Program.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: Middle Tier of Acquisition (MTA) Preliminary Design and Virtual Prototype Rapid Prototyping	-	427.255	16.536
Description: The FLRAA MTA program supports finalization of the preliminary design through execution of the delta Preliminary Design Review (dPDR) to complete any outstanding tasks required to ensure any deficiencies identified during the Competitive Demonstration and Risk Reduction (CD&RR) effort are addressed, preliminary designs are sufficiently documented, and all mission system solutions are identified and incorporated into the design. Additionally, MTA efforts support delivery of two (2) FLRAA portable crew stations (FPC) and a Vehicle Dynamics Model (VDM) completing virtual prototype design activities			
FY 2023 Plans: Completes delta Preliminary Design Review work initiated under Project B47 and continues work on the FLRAA Virtual Prototypes, Portable Crew Station Trainers, and the Vehicle Dynamics Model.			
FY 2024 Plans: Completes design updates resulting in a successful delta Preliminary Design Review, continues design updates to the FLRAA Virtual Prototypes, and delivers the FLRAA Portable Crew Station (FPC) Trainers.			
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to completion of preliminary design.			
Title: Small Business Innovative Research (SBIR) / Small Business Technology Transfer (STTR) Transfer	-	16.186	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023					
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CS7 / FLRAA MTA							
B. Accomplishments/Planned Programs (\$ in Millions)						FY 2022		FY 2023	FY 2024						
<p>Description: Funding transferred in accordance with Title 15 USC § 638</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC § 638</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 funding transferred in accordance with Title 15 USC § 638</p>															
Accomplishments/Planned Programs Subtotals								-	443.441 16.536						
<p>Congressional Add: FLRAA Program Increase</p> <p>FY 2023 Plans: Execute additional scope on the FLRAA Weapon System Development contract to include incorporating design provisions for MEDEVAC, Air Launched Effects data links, Aviation Mission Common Server, and Heads Up display capabilities. Further refine and mature Government Furnished Equipment and associated models to support the FLRAA MTA program execution.</p>						FY 2022		FY 2023							
								-	23.000						
<p>Congressional Add: Modular Communication, Command, and Control Suite</p> <p>FY 2023 Plans: Mature technologies and models supporting modular communication, command, and control mounted form factor prototyping efforts.</p>								-	12.000						
Congressional Adds Subtotals								-	35.000						
C. Other Program Funding Summary (\$ in Millions)															
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
• B47: Future Vertical Lift	505.209	210.194	1,027.608	-	1,027.608	1,035.409	676.532	725.666	733.758	Continuing	Continuing				
Remarks															
The FLRAA MTA was initiated under PE 0603801A/B47 - Future Vertical Lift in FY 2022 and was restructured into the unique Project CS7 for FY 2023 through the remainder of the MTA Program.															
D. Acquisition Strategy															
The Future Long Range Assault Aircraft (FLRAA), Future Vertical Lift (FVL) Capability Set Three (CS3) is the program that will develop the next generation of affordable vertical lift tactical assault / utility aircraft for the Army.															

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CS7 / FLRAA MTA
<p>The FLRAA MTA program supports finalization of the preliminary design through execution of the delta Preliminary Design Review (dPDR) to complete any outstanding tasks required to ensure any deficiencies identified during the Competitive Demonstration and Risk Reduction (CD&RR) effort are addressed, preliminary designs are sufficiently documented, and all mission system solutions are identified and incorporated into the design. Additionally, FLRAA MTA efforts support design and development of FLRAA virtual prototypes consisting of a FLRAA Vehicle Dynamic Model (VDM) and FLRAA Portable Crew stations (FPC). The VDM will be used in conjunction with an FPC prototype simulator integrated within the CABAIL and the AMBL capabilities. The VDM will perform hardware-in-the-loop tests during the design phase for early validation by offline simulation; conduct early Tactics, Techniques, and Procedures (TTPs) experimentation prior to user evaluations; and to participate in Army warfighting exercises for development of Multi-Domain Operation doctrine and concepts.</p>		
<p>The follow-on physical weapons system development will leverage the outcomes of the FLRAA MTA program to provide the Joint Force with a capability that possesses transformational increases in speed, range, and maneuverability to allow the Army to retain the freedom of maneuver and win in Multi Domain Operations (MDO). This medium lift tactical assault and medical evacuation (MEDEVAC) aircraft will augment the Army's H-60 Black Hawk utility helicopter fleet to provide Combat Aviation Brigades with long-range, high-speed options that are survivable in contested environments.</p>		
<p>The Army is executing a hybrid acquisition approach to design, develop, and deliver the FLRAA weapons system. In order to support the Army's modernization strategy and concept for multi-domain operations, the FLRAA program will deliver the first aircraft to the first unit in FY 2030, with additional aircraft in FY 2031. This hybrid approach builds on the JMR-TD efforts (started in 2013), the Army's AoA (completed in July 2019), and multiple ongoing risk mitigation efforts.</p>		
<p>The Army's risk mitigation activities ahead of the MTA and Weapon System Development include: (1) additional conceptual design and flight envelope expansion tasks on the existing JMR-TD Technology Investment Agreements (TIA); (2) MOSA, FVL Architecture Collaboration Working Group (with participation from industry and academia) to establish a common architecture requirements framework for FLRAA and FARA system development; and (3) a CD&RR effort, awarded to two Project Agreement Holders (PAH), using an AMTC OTA agreements to provide substantiating technical documentation on weapon system designs, requirements decompositions, trade-studies, and requirements feasibility for the FLRAA PoR. These risk reduction activities maintain industry engagement and momentum from the JMR-TD program, inform capabilities and system requirements, and provide initial trade assessments for the final operational requirements. They also inform the final acquisition strategy, mature the Government's architecture requirements development, and transition appropriate Science and Technology investments to the PoR. CD&RR Phase II incorporated efforts leading to preliminary design using a digital engineering environment. The Army competitively awarded the Weapon System Development contract in December 2022 to one vendor with a hybrid acquisition approach.</p>		
<p>This approach includes the opportunity to employ new DoDI 5000.80 (Operation of the Middle Tier of Acquisition (MTA)) authorities along with a tailored DoDI 5000.85 (Major Capability Acquisition) acquisition strategy. Finally, the Army is also addressing life cycle affordability, sustainability, and maintainability early in the program. The FLRAA program is employing multiple strategies including should cost reduction opportunities, use of a digital thread from design through sustainment, and stochastic sustainment modeling. FLRAA is also one of the Army's pilot programs for life cycle intellectual property and data strategy development.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev					Project (Number/Name) CS7 / FLRAA MTA						
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Small Business Innovative Research (SBIR) / Small Business Technology Transfer (STTR) Transfer	TBD	TBD : TBD	-	-		16.186	Sep 2023	-		-		-	0.000	16.186	-	
Subtotal				16.186		-		-		-		-	0.000	16.186	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
FLRAA MTA delta Preliminary Design and Virtual Prototyping	C/Various	Bell Textron Inc. : Fort Worth, TX	-	-		391.992	Dec 2022	16.536	Nov 2023	-		16.536	6.708	415.236	-	
FLRAA MTA Government Furnished Equipment	Various	Various : Various	-	-		37.295	Mar 2023	-		-		-	0.000	37.295	-	
Subtotal				429.287		16.536		-		16.536		6.708	452.531	N/A		
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
FLRAA MTA Engineering and Technical Services	Various	Various : Redstone Arsenal, AL	-	-		32.968	Mar 2023	-		-		-	0.000	32.968	-	
Subtotal				32.968		-		-		-		-	0.000	32.968	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				-	-	478.441		16.536		-		16.536	6.708	501.685	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023																
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CS7 / FLRAA MTA																						
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
FLRAA delta Preliminary Design (MTA)																														
FLRAA Virtual Prototyping (MTA)																														
FLRAA Virtual Prototype Delivery 1																														
FLRAA Virtual Prototype Delivery 2																														

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CS7 / FLRAA MTA	
Schedule Details			
Events	Start	End	
	Quarter	Year	Quarter
FLRAA delta Preliminary Design (MTA)	1	2023	2
FLRAA Virtual Prototyping (MTA)	1	2023	1
FLRAA Virtual Prototype Delivery 1	4	2024	4
FLRAA Virtual Prototype Delivery 2	4	2024	4

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
F12: Future Attack Reconnaissance Aircraft	-	612.065	446.089	428.865	-	428.865	657.119	755.427	1,053.756	1,065.513	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

The Future Attack Reconnaissance Aircraft (FARA) Project's funding provides for the development of a Capability Set 1 aircraft system within the Future Vertical Lift (FVL) family of systems. FVL Capability Set 1 aircraft will conduct attack/reconnaissance missions in support of the Army's modernization objective of conducting Joint All Domain Operations (JADO). FARA will support the Army, including Special Operations Command (USSOCOM) and the Joint Force, in a contested, near peer threat environment. The FARA platform will fill the gap in capability for light weight attack/reconnaissance while significantly increasing speed, range, survivability, and lethality, providing Combatant Commanders with greatly increased tactical, operational and strategic capabilities.

Funding supports the development and integration of Government Furnished Equipment (GFE). FARA will be powered by Improved Turbine Engine (ITE), with maximum cruise airspeed greater than or equal to 180 KTAS, an integrated Area Weapons System (AWS), Modular Effects Launcher (MEL) for Air Launched Effects (ALE) and Long Range Precision Munition (LRPM), and Modular Open System Approach (MOSA) digital backbone.

The FVL Capability Set 1 Initial Capabilities Requirements Document (ICRD) was approved in July 2018 under the name Future Attack Reconnaissance Aircraft (FARA). An Abbreviated Capability Development Document (A-CDD) was approved on 9 Apr 2021 and updated on 15 Aug 2022. The Acquisition Approach and Determination and Findings for Other Transaction Authority for Prototyping agreements were approved on 1 February 2019 by the Acting Under Secretary of Defense (Acquisition and Sustainment) to execute a Competitive Prototyping effort.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Future Attack Reconnaissance Aircraft	FY 2022	FY 2023	FY 2024
<p>Description: Design, build, and test Competitive Prototype (CP) aircraft to rapidly develop and field a Multi-Domain Operations capable attack/reconnaissance vertical lift aircraft.</p> <p>FY 2023 Plans: Continues support of hardware (HW) and software (SW) development, component/subsystem Assembly, Integration and Test (AI&T), SW and HW In-the-Loop efforts, GFE planning and MOSA development in preparation for final AI&T of the CP aircraft and supports CP Flight Demonstration. Continues Increment #1 Weapons System preliminary design (air vehicle and mission systems development) with an in-process design review. Supports the first of two Open Systems Verification Demonstrations that will verify each vendors compliance with MOSA standards. Continues support of documentation requirements for the Program of Record (POR) and supports an Engineering and Manufacturing Development (EMD) Draft Request For Proposal (RFP) release. Initiates </p>	607.065	420.172	428.865

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft	
B. Accomplishments/Planned Programs (\$ in Millions)			
formation and preparation of the Source Selection Evaluation Board (SSEB) for EMD contract award and down selection to one vendor.			FY 2022
Supports early program analyses of life cycle affordability, sustainability, and maintainability. The FARA program is employing multiple strategies including should cost reduction opportunities, use of a digital thread from design through sustainment, and stochastic sustainment modeling.			FY 2023
FY 2024 Plans: Continues support of hardware (HW) and software (SW) development, component/subsystem Assembly, Integration and Test (AI&T), SW and HW In-the-Loop efforts, GFE planning/development and MOSA development in preparation for final AI&T of the CP aircraft and conduct CP Flight Demonstration. Continues Increment #1 Weapons System preliminary development and design (air vehicle and mission systems development) culminating in- a Preliminary Design Review (PDR) in FY 2025. Supports the second and final Open Systems Verification Demonstrations that will verify each vendors compliance with MOSA standards. Supports the flight testing efforts associated with the FARA CP aircraft. Continues support of documentation requirements for the Program of Record (POR). Supports release of the final EMD RFP and initiates the SSEB review process for EMD contract award and down selection to one vendor.			FY 2024
Supports early program analyses of life cycle affordability, sustainability, and maintainability. The FARA program is employing multiple strategies including should cost reduction opportunities, use of a digital thread from design through sustainment, and stochastic sustainment modeling.			
FY 2023 to FY 2024 Increase/Decrease Statement: Funding changes reflects planned lifecycle of this effort.			
Title: SBIR/STTR Transfer Description: Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) FY23 SBIR/STTR Funding transferred in accordance with Title 15 USC §638			- 15.917 -
FY 2023 Plans: SBIR/STTR amount in accordance with Title 15 USC 638.			
FY 2023 to FY 2024 Increase/Decrease Statement: SBIR/STTR amount in accordance with Title 15 USC 638.			
Accomplishments/Planned Programs Subtotals			607.065 436.089 428.865

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023					
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft								
										FY 2022	FY 2023				
Congressional Add: FARA All Electrical Flight Controls										5.000	10.000				
FY 2022 Accomplishments: Support analysis of Flight Control Systems for FARA Air Vehicle / Weapon System Preliminary Design.															
FY 2023 Plans: Support analysis of Flight Control Systems for FARA Air Vehicle / Weapon System Preliminary Design.															
Congressional Adds Subtotals										5.000	10.000				
C. Other Program Funding Summary (\$ in Millions)															
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
• B47: Future Vertical Lift	505.209	210.194	1,027.608	-	1,027.608	1,035.409	676.532	725.666	733.758	Continuing	Continuing				
• A12001: Future Attack Recon Aircraft	-	-	0.000	-	0.000	-	-	81.717	82.507	Continuing	Continuing				
• CK7: FARA Ecosystem	21.183	22.748	29.151	-	29.151	30.033	30.975	31.305	31.655	0.000	197.050				
Remarks															
A12001: FARA funding line represents the follow on procurement effort associated with Army Program Element (APE) 0603801A.															
D. Acquisition Strategy															
The Future Attack Reconnaissance Aircraft (FARA) program is executing a streamlined acquisition approach leveraging modern tools, processes, and industry innovation, while employing efficiencies provided by the Army's modernization enterprise and Cross Functional Team (CFT) framework. The aircraft developed under this program will utilize a MOSA approach, which will enable more efficient and cost effective mission equipment integration throughout the lifecycle of the weapon system.															
The Army is executing a two-phased FARA Competitive Prototyping (CP) effort from FY 2019 through Milestone B using Other Transaction Authority for Prototyping (OTAP). The scope of this effort includes prototype design and fabrication process refinement, subsystem development and representative system level testing, flight control and mission processor software development/testing, development of systems integration labs, development or modification of test fixtures and facilities, preparation of test plans and reports, the generation of airworthiness documentation, and testing of all processes and subsystems within the prototype aircraft.															
The initial design and risk reduction phase was awarded in April 2019 to five industry performers. Phase two began in March 2020 with two of the five industry performers selected to proceed to final detailed design and the development, integration and test of a flyable prototype air vehicle. Phase two will culminate with flight testing of the FARA Competitive Prototypes to inform Milestone B and entry to EMD.															

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
The Competitive Prototype effort will inform full FARA Weapon System requirements development process, and will develop the data needed to reduce the risks for full Weapon System design, integration, testing, and qualification to be completed during the FARA EMD phase. An OTAP modification was executed with the two performers to enable continued weapons system preliminary design maturation and the conduct of a Weapons System Preliminary Design Review prior to a Milestone B decision.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army													Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev					Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		15.917	Sep 2023	-	-	-	-	-	0.000	15.917	Continuing
PM FARA System Engineering and Program Mangement	Various	Various : Redstone Arsenal, AL	22.131	17.091	Mar 2022	20.582	Mar 2023	21.443	Mar 2023	-	-	21.443	Continuing	Continuing	Continuing
		Subtotal	22.131	17.091		36.499		21.443		-	-	21.443	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Competitive Prototype (CP) Execution - Other Vendors	C/Various	CCDC AvMC : Redstone Arsenal, AL	24.016	-		-		-		-		-	0.000	24.016	-
Competitive Prototype (CP) & Weapons System Preliminary Design - Raider X	C/CS	Sikorsky Aircraft Corporation : Stratford, CT	353.500	316.588	Oct 2021	195.630	Oct 2022	176.121	Oct 2023	-	-	176.121	0.000	1,041.839	-
Competitive Prototype (CP) & Weapons System Preliminary Design - 360 Invictus	C/CS	Bell Textron, Inc. : Fort Worth, TX	323.348	178.487	Oct 2021	133.289	Oct 2022	139.425	Oct 2022	-	-	139.425	0.000	774.549	-
GFE - Improved Turbine Engine Development - Single Engine Configuration	C/CPIF	PM ATE : Redstone Arsenal	26.740	16.670	Dec 2021	6.113	Dec 2022	7.466	Dec 2023	-	-	7.466	Continuing	Continuing	Continuing
GFE - Modular Effects Launcher Development	Various	CCDC AvMC : Redstone Arsenal, AL	22.603	16.544	Dec 2021	12.316	Dec 2022	17.182	Dec 2022	-	-	17.182	Continuing	Continuing	Continuing
GFE - Area Weapon System Development	Various	CCDC AC : Picatinny Arsenal, NJ	20.742	5.345	Dec 2021	2.256	Dec 2022	3.647	Dec 2023	-	-	3.647	Continuing	Continuing	Continuing
GFE - Radar Development	Various	CCDC C5ISR : Aberdeen Proving Ground, MD	6.509	0.899	Mar 2022	-	-	-	-	-	-	-	0.000	7.408	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft								
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
GFE - Integration and Support	TBD	Various : Various	-	6.788		7.964		14.334		-		14.334	Continuing	Continuing	Continuing	
Modular Open System Approach Development	Various	CCDC AvMC : Redstone Arsenal, AL	42.288	23.573	Dec 2021	12.646	Dec 2022	13.165	Dec 2023	-		13.165	Continuing	Continuing	Continuing	
Subtotal		819.746	564.894		370.214		371.340		-		371.340	Continuing	Continuing	N/A		
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Engineering Services Support - CP Air Vehicle Dev & Test	MIPR	Redstone Test Center, CCDC-AvMC: Redstone Arsenal, AL	8.723	3.805	Dec 2021	4.873	Dec 2022	7.251	Dec 2023	-		7.251	0.000	24.652	Continuing	
Engineering Services Support - CP Airworthiness	MIPR	CCDC-AvMC-SRD: Redstone Arsenal, AL	21.239	15.417	Mar 2022	18.411	Mar 2023	19.535	Mar 2024	-		19.535	0.000	74.602	Continuing	
Simulation, Studies, and Analysis	TBD	Various : Various	10.091	5.858	Mar 2022	6.092	Mar 2023	9.296	Mar 2024	-		9.296	Continuing	Continuing	Continuing	
FARA All Electrical Flight Controls	TBD	Various : Various	-	5.000	Aug 2022	10.000		-		-		-	0.000	15.000	-	
Subtotal		40.053	30.080		39.376		36.082		-		36.082	Continuing	Continuing	N/A		
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				881.930	612.065		446.089		428.865		-		428.865	Continuing	Continuing	N/A

Remarks

Under the Other Transaction Authorities for Prototyping (OTAP), five incrementally funded agreements were awarded in April 2019, which have payments based on performance milestones. Funding will be incrementally added to the existing awards by modification as negotiated with each performer. In March 2020, two of the five performers were selected for continued execution through final design, prototype build, and flight testing; the other three performers were issued a stop work order and ceased to receive additional funding. In FY 2023, the OTAP agreements were modified to incorporate additional scope for Weapons System Preliminary Design maturation efforts and the performance period was extended to support a Milestone B decision.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023														
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft																				
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
OTAP CP Build (10 U.S.C. 2371b)					Competitive Prototype Build																							
OTAP CP Test (10 U.S.C. 2371b)													Competitive Prototype Test															
Milestone B Documentation Dev. and Coord.					Milestone B Documentation Dev. & Coord.																							
Contract Requirement Package Development					EMD CRP Development																							
EMD Request for Proposal Release													1 EMD RFP Release															
EMD Proposal Submission/Evaluation													EMD Proposal Submission/Evaluation															
Weapons System PDR																	2 Weapons System PDR											
Milestone B																	3 Milestone B											
EMD Contract Award																	4 EMD CA											
EMD Phase													EMD Phase												5 Weapons System CDR			
Weapons System CDR																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft		
Schedule Details				
Events	Start	End	Quarter	Year
OTAP Competitive Prototype (CP) Design (10 U.S.C. 2371b)	3	2019	2	2020
OTAP CP - Down Select to 2 Performers (10 U.S.C. 2371b)	2	2020	2	2020
OTAP CP Build (10 U.S.C. 2371b)	3	2020	4	2025
OTAP CP Test (10 U.S.C. 2371b)	4	2024	4	2025
Milestone B Documentation Dev. and Coord.	1	2021	1	2026
Contract Requirement Package Development	1	2021	3	2023
EMD Request for Proposal Release	2	2024	2	2024
EMD Proposal Submission/Evaluation	3	2024	1	2026
Weapons System PDR	2	2025	2	2025
Milestone B	1	2026	1	2026
EMD Contract Award	2	2026	2	2026
EMD Phase	2	2026	2	2032
Weapons System CDR	2	2027	2	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)											PE 0603804A / Logistics and Engineer Equipment - Adv Dev		
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	-	10.797	24.638	7.604	-	7.604	12.480	2.787	2.817	2.849	Continuing	Continuing	
526: Marine Orien Log Eq Ad	-	2.402	2.475	2.434	-	2.434	2.429	2.787	2.817	2.849	Continuing	Continuing	
EW8: Armored Engineer Vehicles	-	4.395	7.163	5.170	-	5.170	10.051	-	-	-	0.000	26.779	
G11: Adv Elec Energy Con Ad	-	4.000	15.000	-	-	-	-	-	-	-	0.000	19.000	

A. Mission Description and Budget Item Justification

This Program Element (PE) supports advanced component development and prototypes of new and improved technologies for combat support and combat service support equipment essential to sustaining combat operations. Advancements in bridging, armored engineer vehicles to include development of a robotic capability Remote Control System for the Assault Breacher Vehicle, electric power generators, material-handling, environmental control, shelter systems, cargo aerial delivery, field service systems, mortuary affairs equipment and petroleum equipment are necessary to improve safety and increase the tactical mobility, operational capability, lethality and survivability on the digital battlefield and to provide for greater sustainment while reducing the logistics support burden. Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, survivability, supportability, energy efficiency, environmental, bulk fuel, water generation, regulatory compliance and reliability of existing systems.

B. Program Change Summary (\$ in Millions)

<u>gram Change Summary (\$ in Millions)</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	11.055	9.638	7.764	-	7.764
Current President's Budget	10.797	24.638	7.604	-	7.604
Total Adjustments	-0.258	15.000	-0.160	-	-0.160
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.258	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.160	-	-0.160

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: G11: Adv Elec Energy Con Aa

Congressional Add: *Lightweight Portable Power*

Congressional Add: *Mobile micro-reactor program*

FY 2022	FY 2023
4.000	3.000
-	12.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023	
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022	FY 2023
Congressional Add Subtotals for Project: G11		4.000	15.000
Congressional Add Totals for all Projects		4.000	15.000
Change Summary Explanation Decreased funding to support higher Army priorities.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 4					PE 0603804A / Logistics and Engineer Equipment - Adv Dev				526 / Marine Orien Log Eq Ad			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
526: Marine Orien Log Eq Ad	-	2.402	2.475	2.434	-	2.434	2.429	2.787	2.817	2.849	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 526 Marine Orientation Logistics Equipment Advanced Development line supports current Army Watercraft Systems (AWS) that provide the Combatant, Multi-Domain Operations (MDO) and Joint All Domain Operations (JADO) Commanders with an organic waterborne lift capability to enable Dynamic Force Repositioning (DFR) in support of unified land operations. AWS provides the waterborne transportation capability to deliver combat-configured equipment with personnel, vehicles and sustainment cargo (Bulk Water and Fuel), through fixed, degraded and austere ports, inland waterways, remote and unimproved beaches and coastlines for missions across the spectrum of military operations. AWS bridges the gap between strategic sealift and sustains lethality in littoral areas or where mature ports and road networks are unavailable. Watercraft are a key enabler to Army and Joint force in support of Title 10 and DODD missions of providing logistics to joint operations and campaigns, including DODD missions of providing logistics to joint operations and campaigns, including joint logistics over joint logistics over-the-shore and intra-theater transport of time sensitive, mission-critical personnel and equipment, and in support of amphibious and riverine operations (DODD 5100.01).

This Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, and survivability while increasing the lethality, tactical mobility, and operational capability of the Army Mariner to preserve the Combatant Commanders requirement of "freedom of seas" access in all areas of the world particularly the littorals, to support maneuver operations in all Areas of Responsibility. All modification and services efforts are critical enablers for the success Army's Watercraft Systems Transformation Strategy (AWSTS) and continued fulfillment of the AWS Title 10 mission.

Funded engineering efforts will address critical gaps in these areas for the current AWS for regaining capability, while at the same time researching, developing and testing emergent technologies. To support future acquisitions and future fleet planning, funding efforts will include conducting trade studies, Business Case Analyses to inform the requirement development process, and support Analysis of Alternatives (AoA). The funding enables Army's compliance with the National Defense Authorization Act of 1996 and 502(6) of the Clean Water Act and compliance with Environmental protection Agency (EPA) emission standards.

FY 2024 RDTE dollars in the amount of \$2.434 million supports modernization of the current Army Watercraft fleet by investigating technology insertions, including, but not limited to: force protection, prognostics & preventative maintenance, vessel electronics, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of operational requirements and early user feedback to support future sustainment and operational movement operating concepts. All Army Watercraft modernization efforts will incorporate Predictive Logistics which includes digital updates across commercial solutions which will improve readiness, predictive maintenance, unplanned emergency repairs.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Environmental Compliance Projects (UNDs)	FY 2022	FY 2023	FY 2024
0.045	0.055	0.070	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 4	PE 0603804A / Logistics and Engineer Equipment - Adv Dev	526 / Marine Orien Log Eq Ad	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Description: Environmental projects enable compliance with requirements as defined under in the law Uniform National Discharge Standards (UNDS) and Environmental Protection Agency (EPA) emissions standards. The EPA reviews the UNDS Code of Federal Regulations (CFR) language in five-year increments separated into three batches (types of discharge). This is an ongoing assessment of statutory language which may or may not result in material solution change.			
FY 2023 Plans: Batch Three, Phase III - Army UNDS Implementation Plan (training documentation)			
FY 2024 Plans: Update UNDs Awareness brief for Batch III Discharges and develop an environmental compliance waterfront training brief.			
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2024 increase is for completion of Batch 111 Discharges and to develop an Environmental compliance waterfront training brief for the Mariners.			
Title: Force Protection Capability	0.898	0.530	0.524
Description: Army Watercraft Systems (AWS) Force Protection capability is limited to defensive measures. Current efforts include development of gunner station and weapon station locations, integration of Common Remotely Weapon Station (CROWS) and non-lethal Escalation of Force (EoF). The EoF capability includes white light, an acoustic hailing device, and Forward Looking Infra-Red (FLIR) cameras.			
FY 2023 Plans: Support to complete testing and final TDP for the CROWS aboard LCU watercraft fleet. The EoF capabilities could include, but are not limited to, white light, green dazzler, an acoustic hailing device, percussion grenades, sub surface surveillance, and Electro-Optical / Infrared (EO/IR) capabilities.			
FY 2024 Plans: Support EoF capabilities that include, but are not limited to, white light, an acoustic hailing device, sub surface surveillance, and Electro-Optical / Infrared (EO/IR) capabilities.			
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2024 decrease is due to test completion for the CROWS aboard LCU watercraft.			
Title: Army Watercraft Program Support	0.520	1.100	1.190
Description: Army Watercraft Program Support includes Program Management and System Engineering matrix salaries and in-house contractor salaries, travel, and other support costs required to effectively manage the AWS projects and provide contractor			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
oversight. It also includes benefits, personnel training, and other Government costs required to retain a professional acquisition workforce.			
FY 2023 Plans: Provide engineering support for C5ISR Studies and Force Protection design work.			
FY 2024 Plans: Provide engineering support for C5ISR Studies, LSV technical upgrades and Force Protection design work.			
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2024 increase is due to development of C5ISR and LSV technical upgrades.			
Title: Trade Studies and Business Analysis Description: Conduct Affordability and Feasibility Studies for concept development for future vessel platforms.	0.453	0.050	0.050
FY 2023 Plans: Funding will support feasibility studies to improve concept development for current fleet and future fleet.			
FY 2024 Plans: Funding will continue to support concept development improvements for the current and future fleet.			
Title: SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC §638	-	0.090	-
FY 2023 Plans: SBIR/STTR decrease \$90K			
FY 2023 to FY 2024 Increase/Decrease Statement: decrease due to SBIR/STR transfer \$90K.			
Title: Predictive Logistics Description: As Army Watercraft are equipped with subsystems that allow for sharing of digital information it is a natural evolution to incorporate Predictive Logistics which includes digital updates across commercial solutions which will improve readiness, improve maintainability with predictive maintenance, and timely repair of unplanned emergency repairs.	-	0.050	0.100
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
2040 / 4	PE 0603804A / Logistics and Engineer Equipment - Adv Dev	526 / Marine Orien Log Eq Ad	
Funding will support development of digital solutions to establish predictive logistics framework that allows for improved maintainability and timely emergency repairs.			
FY 2024 Plans: Funding to ramp up of predictive logistics to improve new digital integrated subsystem upgrades on the vessels.			
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2024 increase is due to the ramp up of a predictive logistics effort that takes advantage of newly integrated digital subsystem upgrades on legacy vessels (i.e. engines and generators) that allow for improved maintainability and supportability.			
Title: Test Support Description: Supports in house and external performance tests of concept hardware. In addition, supports evaluation of subsystems and components for Army Watercraft Systems Current Fleet.	-	0.150	0.500
FY 2023 Plans: Funding will support test and evaluation of solutions to establish that allows for improved maintainability, readiness, and timely emergency repairs.			
FY 2024 Plans: Funding will continue to support test and evaluation engineering design changes on the fleet to improve maintainability and readiness of the fleet.			
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2024 increase is due to the ramp up of engineering design changes and obsolescence management required to improve current watercraft readiness.			
Title: At Sea Transfer Technology Description: At Sea Transfer Technology enables roll on and roll off (RO/RO) capability from vessels at sea and causeway transport of vehicles and equipment to the beach or shore. The current effort serves to inform development of the Service Life Extension Program (SLEP) for the Modular Warping Tug (MWT) and Causeway Ferru (CF) which are principle working platforms on the Modular Causeway System (MCS)	0.486	0.450	-
FY 2023 Plans: Complete MCS TDP			
FY 2023 to FY 2024 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity			R-1 Program Element (Number/Name)			Project (Number/Name)										
2040 / 4			PE 0603804A / Logistics and Engineer Equipment - Adv Dev			526 / Marine Orien Log Eq Ad										
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023	FY 2024						
MCS TDP is complete.																
											Accomplishments/Planned Programs Subtotals					
											2.402					
											2.475					
											2.434					
C. Other Program Funding Summary (\$ in Millions)																
<u>Line Item</u>		<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Base</u>	<u>FY 2024</u>	<u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>			
• MA4501: MODIFICATION KITS		32.634	32.613	20.282	-	20.282	24.327	20.505	36.414	33.089	Continuing	Continuing				
• MA4502: INSTALLATION OF MODIFICATIONS		4.240	6.957	5.833	-	5.833	8.352	5.706	5.709	5.714	Continuing	Continuing				
• M11101: Army Watercraft Esp		58.009	47.889	30.592	-	30.592	56.597	55.641	70.072	30.395	0.000	349.195				
<u>Remarks</u>																
D. Acquisition Strategy																
The Product Manager for Army Watercraft intends to leverage government and public research centers Ground Vehicle Systems Center (GVSC), Naval Surface Warfare Center (NSWC) Philadelphia, AWS System Technical Support (STS) contractor (Noblis) and known public research institutes (Battelle) along with associated contract mechanisms to prototype, test, and evaluate component technologies that can improve maintainability and supportability, increase readiness, and reduce costs of Army Watercraft Systems.																
A new STS Solicitation is currently being competed through a Source Selection Evaluation Board. The new contract projected for award no later than Aug. 1 2023. The period of performance will go through FY23-FY27.																

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) 526 / Marine Orien Log Eq Ad								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.090		-		-		-	Continuing	Continuing	-	
Subtotal				-	-	0.090		-		-		-	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Force Protection, Escalation of Force (EoF) Development (i.e. CROWS)	MIPR	TARDEC : Warren, MI	5.290	0.898	Nov 2021	0.530	Nov 2022	0.524	Nov 2023	-		0.524	Continuing	Continuing	-	
Environmental Compliance Uniform National Discharge Standards (UNDS)	MIPR	Carderock : Maryland and Pennsylvania	3.403	0.045	Nov 2021	0.055	Oct 2022	0.070	Oct 2023	-		0.070	Continuing	Continuing	-	
Trade Study Analyses	TBD	TBD : TBD	-	0.453	Feb 2022	0.050	Feb 2023	0.050	Feb 2024	-		0.050	0.000	0.553	-	
Predictive Logistics	TBD	TBD : TBD	-	-		0.050	Jun 2023	0.100	Dec 2024	-		0.100	0.000	0.150	-	
At Sea Transfer Technology	MIPR	Battelle : Battelle	7.498	0.486	May 2022	0.450	May 2023	-		-		-	0.000	8.434	-	
Subtotal				16.191	1.882		1.135		0.744			-	0.744	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Army Watercraft Program Support	MIPR	Detroit Arsenal PMs, TARDEC, NAVSEA Carderock : Maryland, Warren, MI	2.647	0.520	Dec 2021	1.100	Dec 2022	1.190	Dec 2023	-		1.190	Continuing	Continuing	-	
Subtotal				2.647	0.520		1.100		1.190			-	1.190	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev						Project (Number/Name) 526 / Marine Orien Log Eq Ad						
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Test and Evaluation	TBD	TBD : TBD	-	-		0.150	Jun 2023	0.500	Oct 2023	-		0.500	0.000	0.650	-	
Subtotal				-	-	0.150		0.500		-		0.500	0.000	0.650	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				18.838	2.402		2.475		2.434		-		2.434	Continuing	Continuing	N/A

Remarks

Supply chain shortages and labor force challenges continue to negatively impact programmatic costs and schedules.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023															
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)																				
2040 / 4				PE 0603804A / Logistics and Engineer Equipment - Adv Dev				526 / Marine Orien Log Eq Ad																				
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028														
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4											
Army Watercraft Program Support																												
Force Protection: Escalation of Force (EOF)																												
Force Protection: CROWS on LSV Class		1																										
Force Protection: CROWS on LCU Class																												
Environmental Compliance																												
Uniformed National Discharge Standards (UNDS)																												
UNDS Batch 3				1																								
Trade Studies and Business Analyses		1																										
Predictive Logistics																												
At Sea Transfer Technology																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Orien Log Eq Ad</i>	
Schedule Details			
Events	Start	End	
	Quarter	Year	Quarter
Army Watercraft Program Support	1	2018	4
Force Protection: Escalation of Force (EOF)	1	2018	4
Force Protection: CROWS on LSV Class	1	2018	2
Force Protection: CROWS on LCU Class	1	2018	4
At Sea Transfer Technology (MCS)	1	2018	1
Modular Warping Tug (MWT) / Causeway Ferry (CF)	1	2018	1
MWT / CF - SLEP Development Contract	4	2018	4
MWT / CF - SLEP Prototype and Proof Concept	1	2018	4
MWT / CF - SLEP Testing	1	2020	4
Environmental Compliance	1	2018	4
Uniformed National Discharge Standards (UNDS)	1	2018	4
UNDS Batch 2	4	2020	4
UNDS Batch 3	4	2022	4
Trade Studies and Business Analyses	4	2019	2
Predictive Logistics	1	2023	4
At Sea Transfer Technology	2	2018	4

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 4					PE 0603804A / Logistics and Engineer Equipment - Adv Dev				EW8 / Armored Engineer Vehicles			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
EW8: Armored Engineer Vehicles	-	4.395	7.163	5.170	-	5.170	10.051	-	-	-	0.000	26.779
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project supports the prototype development, test and evaluation of a robotic capability Remote Control System (RCS) for the Assault Breacher Vehicle (ABV), to include prototype fabrication, developmental testing, operational testing and logistics demonstration / user test events.												
Funding supports modernization of Army Bridging and Armored Engineer Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, increased military load capacities, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes and testing to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.												
FY 2024 Base dollars in the amount of \$5.170 million supports Assault Breacher Vehicle Robotic Control System (ABV RCS) prototype testing, a user jury, test asset shipping, and program support.												
B. Accomplishments/Planned Programs (\$ in Millions)												
Title: Assault Breacher Vehicle (ABV) Remote Control System (RCS)										FY 2022	FY 2023	FY 2024
FY 2023 Plans: Funding will complete development and fabrication of ABV RCS prototypes and refurbish an additional ABV system. Funds will be used to initiate prototype testing on completed assets, conduct the first User Jury, and ship government furnished equipment to and from the test location.										4.395	6.902	5.170
FY 2024 Plans: Funds additional prototype testing, conduct of a second User Jury, test asset shipping, and program support.												
FY 2023 to FY 2024 Increase/Decrease Statement: The main activities for FY24 are continuance of prototype testing and the User Jury, representing decreased requirements from the refurbishment activities conducted in FY23.												
Title: SBIR/STTR Transfer										-	0.261	-
FY 2023 Plans: SBIT/STTR \$261K												
FY 2023 to FY 2024 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) EW8 / Armored Engineer Vehicles	
B. Accomplishments/Planned Programs (\$ in Millions) Decrease due to SBIR/STTR \$261K		FY 2022	FY 2023
		Accomplishments/Planned Programs Subtotals	4.395 7.163 5.170
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy The Assault Breacher Vehicle (ABV) Remote Control System (RCS) program is pursuing prototype development and testing strategy with one vendor to provide an RCS materiel solution for production and integration into the ABV system. Anniston Army Depot (ANAD) previously refurbished 2 ABV assets for prototype development and testing and one additional ABV asset will be refurbished in FY23. One ABV was provided to the vendor in support of prototype development and the other ABV will be shipped to the Army Test Center (ATC) at Aberdeen Proving Grounds (APG). Two ABV assets will be stored/maintained for logistics and training use at Fort Leonard Wood (FLW). The prototype will be developed and refined through prototype test and two User Jury events in FY23 and FY24. Successful completion of prototype testing will be used as the entrance criteria into a FAR Based Development/Production Contract. Under this contract, test assets will be developed with developmental test commencing in 1st quarter FY26 and early user test in FY26. Upon successful completion of both test, Low Rate Initial Production (LRIP) delivery order for production assets will be placed in FY27. First unit equipped is projected in FY28. The current AAO is 33 for ABV-RCS kits.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) EW8 / Armored Engineer Vehicles							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ABV RCS Matrix Functional Support	MIPR	Various : Various	0.949	1.560	Nov 2021	0.880	Nov 2022	0.863	Nov 2023	-		0.863	0.000	4.252	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.261	Jan 2023	-		-		-	0.000	0.261	-
Subtotal		0.949	1.560			1.141		0.863				0.863	0.000	4.513	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ABV RCS Prototype Development and Fabrication	C/TBD	TBD : TBD	-	2.835	Apr 2022	0.606	Apr 2023	-		-		-	0.000	3.441	-
ABV RCS Refurbishment of ABV Assets	MIPR	Anniston Army Depot : Anniston AL	5.438	-		3.018	Mar 2023	-		-		-	0.000	8.456	-
ABV RCS Shipping	TBD	TBD : TBD	0.020	-		0.150	Jul 2023	0.300	Jul 2024	-		0.300	0.000	0.470	-
ABV RCS Prototype Depot Support	RO	ANAD : Anniston Army Depot	-	-		0.194	Jul 2023	0.250	Mar 2024	-		0.250	0.000	0.444	-
Subtotal		5.458	2.835			3.968		0.550				0.550	0.000	12.811	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ABV RCS Test & Evaluation	MIPR	ATC : Aberdeen, MD	-	-		1.954	Jul 2023	3.657	Nov 2023	-		3.657	0.000	5.611	-
User Jury	TBD	TBD : TBD	-	-		0.100	Apr 2023	0.100	Feb 2024	-		0.100	0.000	0.200	-
Subtotal		-	-			2.054		3.757				3.757	0.000	5.811	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) EW8 / Armored Engineer Vehicles					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.407	4.395	7.163		5.170		-		5.170	0.000	23.135	N/A
Remarks												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army												Date: March 2023					
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603804A / Logistics and Engineer Equipment - Adv Dev				EW8 / Armored Engineer Vehicles									
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ABV RCS Request for Prototype Proposals		1															
ABV Overhaul (Qty of 2)																	
ABV RCS Prototype Source Selection																	
ABV RCS Prototype OTA Award		2															
ABV RCS Prototype Development																	
ABV RCS User Jury (First)																	
ABV RCS User Jury (Second)																	
ABV RCS Overhaul/ Refurb																	
ABV RCS RCM Maintenance Planning																	
ABV RCS Prototype Test																	
ABV RCS Provisioning / Logistics Development																	
ABV RCS Dev/Prod Contract Award																	
ABV RCS Dev/Test Asset Build																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

2040 / 4

R-1 Program Element (Number/Name)

PE 0603804A | Logistics and Engineer Equipment - Adv Dev

Project (Number/Name)

EW8 | Armored Engineer Vehicles

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ABV RCS P Spec Development	1	2020	4	2021
ABV RCS Request for Prototype Proposals	1	2022	1	2022
ABV Overhaul (Qty of 2)	4	2021	2	2022
ABV RCS Prototype Source Selection	2	2022	2	2022
ABV RCS Prototype OTA Award	3	2022	3	2022
ABV RCS Prototype Development	3	2022	4	2023
ABV RCS User Jury (First)	3	2023	3	2023
ABV RCS User Jury (Second)	2	2024	2	2024
ABV RCS Overhaul/ Refurb	1	2023	4	2023
ABV RCS RCM Maintenance Planning	1	2023	1	2024
ABV RCS Prototype Test	4	2023	3	2024
ABV RCS Provisioning / Logistics Development	1	2025	2	2028
ABV RCS Dev/Prod Contract Award	2	2025	2	2025
ABV RCS Dev/Test Asset Build	2	2025	1	2026
ABV RCS Developmental Test	1	2026	4	2026
ABV RCS Early User Test	3	2026	1	2027
ABV RCS Design Updates	1	2027	2	2027
ABV RCS LRIP DO award	2	2027	2	2027
ABV RCS Production	2	2027	2	2029
ABV RCS Production Qualification Test	3	2027	1	2029
ABV RCS Operational Test	1	2028	2	2028
ABV RCS Fieldings	4	2028	3	2030

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) G11 / Adv Elec Energy Con Ad			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
G11: Adv Elec Energy Con Ad	-	4.000	15.000	-	-	-	-	-	-	-	0.000	19.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project is a Congressional Interest Item

A. Mission Description and Budget Item Justification

As the DoD's Lead Standardization Activity for Tactical Electric Power (TEP), Project Manager Expeditionary Energy & Sustainment Systems (PM E2S2) matures and integrates technology that will improve the next generation of standard tactical power sources in support of all Services. It supports technical maturation of TEP systems that will extend Army operational mission reach and duration in support of the Army Operating Concept and Multi-Domain Battle.

Funding supports modernization of the current Tactical Electric Power capability with technology insertions including, but not limited to hybrid capabilities, light-weight power solutions, vehicle/tactical microgrid interoperability and Tactical Microgrid Standards (TMS). Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational energy concepts. This project is a Congressional Interest Item. Congressionally provided funds will support analysis and planning for potential transition to the Army of the mobile micro-reactor prototype and capability.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Lightweight Portable Power	4.000	3.000
FY 2022 Accomplishments: FY22 congressional funds to be executed on the continued development of lightweight, portable power generation.		
FY 2023 Plans: FY23 congressional funds to be executed on the final development of a lightweight, portable power generation system.		
Congressional Add: Mobile micro-reactor program	-	12.000
FY 2023 Plans: FY23 congressional funds to be executed in the analysis to support the potential transition of the mobile micro-reactor program.		
Congressional Adds Subtotals	4.000	15.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev					Project (Number/Name) G11 / Adv Elec Energy Con Ad	
C. Other Program Funding Summary (\$ in Millions)										
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>
• 194: Engine Driven Gen Ed	13.102	25.023	12.806	-	12.806	12.151	7.167	3.214	3.291	0.000
• MA9800: Generators And Associated Equip	106.120	112.689	78.364	-	78.364	83.661	91.456	104.272	104.475	Continuing

Remarks**D. Acquisition Strategy**

Complete advanced development pre-Milestone B technology assessments and analysis, and transition products to Engineering and Manufacturing Development (EMD) phase (Milestone B) and subsequent transition to production (Milestone C). Support concept development and demonstration efforts. Products and technologies supported include tactical power and energy sources, alternative/renewable energy systems, power distribution components, and power management and distribution control systems. Perform analysis of Operational Energy related impacts to future development programs to better direct United States Army Combat Capabilities Development Command (CCDC) efforts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) G11 / Adv Elec Energy Con Ad							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Small Tactical Electric Power (STEP) Components	Various	C5ISR : Aberdeen Proving Ground, MD	8.421	4.000	Aug 2022	3.000	May 2023	-	-	-	-	-	Continuing	Continuing	Continuing
Mobile micro-reactor program	Various	Idaho National Labs; Air Force Civil Engineering Cmd : Idaho Falls, ID; Tyndall AF Base, FL	-	-		12.000	May 2023	-	-	-	-	0.000	12.000	-	
Subtotal			8.421	4.000		15.000		-	-	-	-	-	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			8.421	4.000		15.000		-	-	-	-	-	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023							
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) G11 / Adv Elec Energy Con Ad												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Lightweight portable power																				
Modeling and development of lightweight portable power																				
Mobile micro-reactor program																				
Planning and Analysis of MMPP technologies and applications																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) G11 / Adv Elec Energy Con Ad		
Schedule Details				
Events	Start	End	Quarter	Year
Lightweight portable power	2	2021	4	2024
Modeling and development of lightweight portable power	2	2021	4	2024
Mobile micro-reactor program	3	2023	4	2024
Planning and Analysis of MMPP technologies and applications	3	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603807A / Medical Systems - Adv Dev											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
Total Program Element	-	27.768	5.598	1.602	-	1.602	0.596	1.038	1.050	1.062	0.000	38.714				
808: DoD Drug & Vacc Ad	-	6.297	0.403	0.422	-	0.422	0.432	0.442	0.448	0.453	0.000	8.897				
836: Field Medical Systems Advanced Development	-	20.071	5.195	1.180	-	1.180	0.164	0.596	0.602	0.609	0.000	28.417				
FF4: Counterdrug, DDR, Sys Development & Demonstration	-	1.400	-	-	-	-	-	-	-	-	0.000	1.400				
A. Mission Description and Budget Item Justification																
This Program Element (PE) funds development of medical materiel within the early system integration portion of the System Development and Demonstration phase of the acquisition life cycle using 6.4 (Advanced Component Development and Prototype) funding. Program efforts support transition of promising Science and Technology candidate medical technologies (drugs, vaccines, medical devices, diagnostics, and mechanisms for detection and control of disease carrying insects) to larger scale testing in humans for safety and effectiveness. Programs are aligned to meet future force requirements identified within concept documents and organizational structures. This PE also provides funding for Food and Drug Administration (FDA) regulated human clinical trials to gain additional information about safety and effectiveness on the path to licensure for use in humans. These efforts are managed by U.S. Army Medical Materiel Development Activity (USAMMDA) of the U.S. Army Medical Research and Development Command.																
B. Program Change Summary (\$ in Millions)					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total							
Previous President's Budget					37.053	0.598	1.619	-	1.619							
Current President's Budget					27.768	5.598	1.602	-	1.602							
Total Adjustments					-9.285	5.000	-0.017	-	-0.017							
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-							
					-	-	-	-	-							
					-	-	-	-	-							
					-	-	-	-	-							
					-	-	-	-	-							
					-	-	-	-	-							
Congressional Add Details (\$ in Millions, and Includes General Reductions)										FY 2022	FY 2023					
Project: 836: Field Medical Systems Advanced Development																
Congressional Add: Program increase - wearable medical device for TBI prevention												5.000				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022 FY 2023
	Congressional Add Subtotals for Project: 836	5.000 5.000
	Congressional Add Totals for all Projects	5.000 5.000
Change Summary Explanation Decreased funding to support higher Army priorities.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 808 / DoD Drug & Vacc Ad			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
808: DoD Drug & Vacc Ad	-	6.297	0.403	0.422	-	0.422	0.432	0.442	0.448	0.453	0.000	8.897
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project funds development of candidate medical countermeasures for endemic infectious diseases of military relevance. These efforts are in: vaccines, drugs, diagnostic kits/devices. These funds support human clinical effectiveness (capacity to produce a desired size of an effect under ideal or optimal conditions) trials of the drug/vaccine in larger groups that are designed to assess how well the drug/vaccine works and continue safety assessments in a larger group of volunteers. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of medical diagnostic kits and devices. This work, which is performed in military laboratories or civilian pharmaceutical firms, is directed toward the prevention of disease, early diagnosis, and accelerated recovery time once diagnosed to enhance battlefield readiness. All clinical trials are conducted in accordance with United States (U.S.) Food and Drug Administration (FDA) regulations, a mandatory obligation for all military products placed into the hands of medical providers or service members. Product development priorities are determined based upon four major factors: (1) the extent and threat of the disease within the Combatant Commands theater of operations, (2) the clinical severity of the disease, (3) the technical maturity of the proposed solution, and (4) the affordability of the solution (development and production). Products from this Project will transition to PE 0604807A/Project 849 at MS B.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: DoD Drug and Vaccine Advanced Development - Medical Readiness	-	0.366	0.422
Description: Funding is provided for the development of candidate medical countermeasures for military relevant infectious disease focusing on prevention to increase medical readiness. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of drugs, vaccines, medical diagnostic kits and devices			
FY 2023 Plans: Provides Civilian Manpower support for Warfighter Health, Performance and Evacuation Project Management Office			
FY 2024 Plans: Will provide Civilian Manpower support for Warfighter Health, Performance and Evacuation Project Management Office			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase in funding is for the adjustment of Civilian Manpower from FY23 to FY24.			
Title: DoD Drug and Vaccine Advanced Development - Battlefield Care and Return to Fight	6.297	-	-
Description: Funding is provided for the development of candidate medical countermeasures for military relevant infectious disease focusing on early diagnosis and accelerated recovery time. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of drugs, vaccines, medical diagnostic kits and devices			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 808 / DoD Drug & Vacc Ad			
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2022	FY 2023
Title: SBIR/STTR				-	0.037
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638.					-
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638.					
Accomplishments/Planned Programs Subtotals				6.297	0.403
					0.422
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy Test and evaluate in-house and commercially developed products in extensive commercial partner or government-managed clinical trials to gather data required for FDA licensure ensuring government (military) requirements are met with judicious investment.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 808 / DoD Drug & Vacc Ad						
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Medical Product Development Management Services Cost	Various	Not Applicable : Not applicable	33.331	0.528		0.366		0.422		-		0.422	Continuing	Continuing	Continuing
Medical Product Development Management Services Cost	PO	General Dynamics Information Technology, Frederick MD	11.454	1.001		-		-		-		-	0.000	12.455	-
SBIR/STTR Transfer	Various	Various : Various	-	-		0.037		-		-		-	0.000	0.037	-
Subtotal		44.785	1.529		0.403			0.422				0.422	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Rapid Human Diagnostics	Various	Cepheid : CA	2.142	1.300		-		-		-		-	0.000	3.442	-
Treatment for Drug Resistant Battlefield Bacterial Wound Infections	Various	TBD : TBD	-	1.156		-		-		-		-	0.000	1.156	-
Broad Spectrum Antiviral Therapeutic	Various	JHU/APL : Various	-	1.156		-		-		-		-	0.000	1.156	-
Treatment for Drug Resistant Battlefield Wound Infections	C/FFP	Gryphon Scientific LLC : MD	-	1.156		-		-		-		-	0.000	1.156	-
Subtotal		2.142	4.768		-			-				-	0.000	6.910	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			46.927	6.297		0.403		0.422		-		0.422	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023															
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 808 / DoD Drug & Vacc Ad																					
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Treatment for Drug Resistant Battlefield Fungal Wound In...																													
Rapid Human Diagnostic																													
Treatment for Drug Resistant Battlefield Wound Infections																													
Broad Spectrum Antiviral Therapeutic																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 808 / DoD Drug & Vacc Ad	
Schedule Details			
Events	Start	End	
Events	Quarter	Year	Quarter
Treatment for Drug Resistant Battlefield Fungal Wound Infections	3	2021	4
Rapid Human Diagnostic	4	2017	4
Treatment for Drug Resistant Battlefield Wound Infections	4	2022	4
Broad Spectrum Antiviral Therapeutic	4	2022	4

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603807A / Medical Systems - Adv Dev				836 / Field Medical Systems Advanced Development				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
836: <i>Field Medical Systems Advanced Development</i>	-	20.071	5.195	1.180	-	1.180	0.164	0.596	0.602	0.609	0.000	28.417	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification												
This Project funds the demonstration and validation of medical products for enhanced combat casualty care and follow-on care. This Project funds human clinical trials to test the safety and effectiveness of biologics (products derived from living organisms) and devices necessary to meet medical requirements. The Project Manager (PM) also considers factors to reduce the medical logistics footprint through smaller weight, volume, and equipment independence from supporting materials. All clinical trials are conducted in accordance with U.S. FDA regulations. Products from this project will transition to PE 0604807A/Project 832.												

B. Accomplishments/Planned Programs (\$ in Millions)														
												FY 2022	FY 2023	FY 2024
Title: Field Medical Systems Advanced Development - Medical Readiness												4.103	0.195	1.180
Description: Funding is provided for engineering and manufacturing development of medical products for diagnostic devices and testing of medical devices for use in the field. This project provides for the advanced product development and prototyping of Army lifesaving medical field systems. Project supports development and testing of medical products and equipment for deployable forces providing future interoperability of systems on the battlefield and situational awareness of Soldier well-being. Project supports enhancements to Soldier battlefield effectiveness, survivability, and sustainment. This project also supports joint medical field systems and prolonged combat casualty care requirements.														
FY 2023 Plans: Soldier Optimization Decision Aids (SODA): Initiate Software Design, Development, Test Planning, Acquisition Documentation, and Life Cycle Support of Mission planning mobile software apps that give Commanders the tools capable of optimizing Soldier potential and reducing the risk of costly non-battle injuries														
Non-invasive Neuro Assessment Devices (NINAD): Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737). Funding transferred to Program Element 0604110DHA, Project Code 374E.														
FY 2024 Plans: Medical Health Applications: Transitioned more advanced apps from 6.4 - 836 to 832. Will finalize software design, development, test planning, acquisition documentation, and life cycle support of mission planning mobile software apps that give Commanders														

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development	
B. Accomplishments/Planned Programs (\$ in Millions) the tools capable of optimizing Soldier performance and readiness and reducing the risk of costly non-battle injuries related to mental acuity, fatigue management and arctic warfare.		FY 2022	FY 2023
Arctic Medical Capabilities: Will develop a family of casualty care and prevention systems for operation in extreme cold weather per 2021 U.S. Army Arctic Strategy, "Regaining Arctic Dominance".			FY 2024
FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase in FY24 is due to emerging Arctic requirements.			
Title: Field Medical Systems Advanced Development - Battlefield Care and Return to Fight	5.819	-	-
Description: Funding is provided for the development of the medical devices and blood products in support of enhanced combat casualty care.			
Title: Field Medical Systems Advanced Development - Field Hospital and Evacuation	5.149	-	-
Description: Funding is provided for the development of medical devices in support of the medical mission field hospitalization and evacuation.			
Accomplishments/Planned Programs Subtotals	15.071	0.195	1.180
	FY 2022	FY 2023	
Congressional Add: Program increase - wearable medical device for TBI prevention	5.000	5.000	
FY 2022 Accomplishments: Continue development and systems engineering of "Wearable TBI Device" to fulfill US Military-unique needs for TBI prevention; including developmental testing, pre-clinical testing and prototype refinement, environmental testing to ensure conformance to specs, FDA meeting(s), and Military Utility Assessment (MUA) activities.			
FY 2023 Plans: Wearable medical device for TBI Prevention			
Congressional Adds Subtotals	5.000	5.000	
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>
D. Acquisition Strategy Develop in-house or industrial prototypes in government-managed programs to meet military and regulatory requirements for production and fielding.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 836 / Field Medical Systems Advanced Development						
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Medical Product Development Management Services Cost	Various	Not Applicable : Not applicable	48.882	1.564		-		0.466		-		0.466	Continuing	Continuing	Continuing
Medical Product Development Management Services Cost	C/IDIQ	Not applicable : Not applicable	2.295	0.150		-		-		-		-	0.000	2.445	-
	Subtotal		51.177	1.714		-		0.466		-		0.466	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Temporary Corneal Repair	C/Various	Critical Innovations, LLC, GelMEDIX, Endomedix, Inc., Ashvaththa Therapeutics, LLC , University of Southern California, Institute of Surgical Research : Inglewood, CA, Cambridge, MA, Montclair, NJ, Redwo	13.721	2.178		-		-		-		-	0.000	15.899	-
Non-invasive neuro assessment device (NINAD)	C/Various	TBD : TBD	0.800	1.471		-		-		-		-	0.000	2.271	-
Transport Telemedicine Systems (TTS) - MEDHUB Platform	TBD	Cooper Consulting Services : TBD	2.343	2.899		-		-		-		-	Continuing	Continuing	Continuing
Burn Treatment Skin Repair	TBD	TBD : TBD	-	2.760		-		-		-		-	0.000	2.760	-
Platelet-Derived Hemostatic Agent	TBD	TBD : TBD	-	0.316		-		-		-		-	0.000	0.316	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 836 / Field Medical Systems Advanced Development					
Product Development (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Increase - Wearable Medical Device for TBI prevention	TBD	TBD : TBD	3.000	5.000		5.000		-		-		-	0.000	13.000	-
Subtotal			19.864	14.624		5.000		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Medical Product Development Support Cost	Various	Not Applicable : Not applicable	52.372	1.842		-		-		-		-	Continuing	Continuing	Continuing
Medical Health Applications	TBD	TBD : TBD	-	-		0.195		0.714		-		0.714	0.000	0.909	-
Subtotal			52.372	1.842		0.195		0.714		-		0.714	Continuing	Continuing	N/A
Remarks No product/contract costs greater than \$1M individually.															
Test and Evaluation (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Noninvasive Neuro-Assessment Devices (NINAD)	TBD	TBD : TBD	-	1.891		-		-		-		-	0.000	1.891	-
Subtotal			-	1.891		-		-		-		-	0.000	1.891	N/A
Remarks No product/contract costs greater than \$1M individually.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 836 / Field Medical Systems Advanced Development					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	123.413	20.071	5.195		1.180		-		1.180	Continuing	Continuing	N/A
<u>Remarks</u>												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023																
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 836 / Field Medical Systems Advanced Development																					
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Temporary Corneal Repair					R&D development																								
Temporary Corneal Repair -Prototype Testing					Prototype Testing																								
Temporary Corneal Repair- Clinical Study					Clinical Study																								
Noninvasive Neuro Assessment Device development (NINAD)					R&D development																								
Transport Telemedicine Systems (TTS)- MEDHUB Platform																													
Burn Treatment Skin Repair					Prototype Development																								
Medical Health Applications																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Temporary Corneal Repair	2	2016	4	2022
Temporary Corneal Repair -Prototype Testing	2	2018	4	2022
Temporary Corneal Repair- Clinical Study	2	2020	4	2022
Noninvasive Neuro Assessment Device development (NINAD)	1	2019	4	2022
Transport Telemedicine Systems (TTS)- MEDHUB Platform	3	2013	4	2022
Burn Treatment Skin Repair	1	2022	4	2022
Medical Health Applications	1	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) FF4 / Counterdrug, DDR, Sys Development & Demonstration				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
FF4: Counterdrug, DDR, Sys Development & Demonstration	-	1.400	-	-	-	-	-	-	-	-	0.000	1.400	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

Supports the Secretary of Defense approved counterdrug advanced development efforts used in a major re-design of the Forensic Toxicology Drug Testing Laboratory (FTDTL) information management system used to test urine samples for the presence of illegal drugs. The Drug Testing Program - Client Collection System (DTP-CSS) is comprised of several variations of a desktop application used to select service members for random drug testing, prepare labels for urine specimen bottles, and print corresponding chain-of-custody documents. This Project will standardize DTP-CSS across all services and migrate it to a Web-based system.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Forensic Toxicology Drug Testing Laboratory - Information Management System (FTDTL-IMS)	FY 2022	FY 2023	FY 2024
Accomplishments/Planned Programs Subtotals	1.400	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) FF4 / Counterdrug, DDR, Sys Development & Demonstration								
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
FTDTL - IMS Modernization	C/FFP	FIS, Inc. : San Antonio, TX	-	1.400		-		-		-		-	0.000	1.400	-	
Subtotal				1.400		-		-		-		-	0.000	1.400	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				-	1.400		-		-		-		-	0.000	1.400	N/A
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023												
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)																	
2040 / 4				PE 0603807A / Medical Systems - Adv Dev				FF4 / Counterdrug, DDR, Sys Development & Demonstration																	
Event Name		FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027			FY 2028					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FTDTL-IMS Modernization																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) FF4 / Counterdrug, DDR, Sys Development & Demonstration

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FTDTL-IMS Modernization	1	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603827A / Soldier Systems - Advanced Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	25.288	23.444	27.681	-	27.681	29.981	32.267	32.607	32.970	Continuing	Continuing
CF2: Integrated Soldier Systems Prototyping (SL CFT)	-	2.963	3.831	3.688	-	3.688	3.728	3.988	4.030	4.075	0.000	26.303
ET8: Personnel Airdrop System Development	-	1.113	1.853	2.208	-	2.208	0.932	2.311	2.336	2.363	Continuing	Continuing
S53: Clothing And Equipment	-	6.431	3.078	4.700	-	4.700	8.150	8.790	8.884	8.982	Continuing	Continuing
S54: Small Arms Improvement	-	10.659	9.248	9.094	-	9.094	9.183	9.184	9.281	9.384	0.000	66.033
VS4: Soldier Protective Equipment	-	4.122	5.434	7.991	-	7.991	7.988	7.994	8.076	8.166	Continuing	Continuing
A. Mission Description and Budget Item Justification												
A portion of this funding line is directly aligned to the Soldier Lethality Army Modernization Priority. This Program Element (PE), Advanced Component Development and Prototypes, manages the Soldier as a system to increase combat effectiveness, test and deliver tangible products that save Soldiers lives and improve combat capability. The PE provides funding for evaluating, developing, and testing emerging technologies and critical Soldier support systems to reduce technology risk.												
CF2 Develop and maintain a PEO Soldier Futures Strategy ICW the Soldier Lethality Cross Functional Team and all DEVCOM Centers laying out a road-map for the Army of 2040 and beyond to execute Multi Domain Operations. Provide prototyping capabilities for evaluation and integration. Execute evaluation of new measurements and methodologies from the S&T community, execute system level evaluation environments, and support Soldier system modeling. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team.												
ET8 Personnel Airdrop System improves Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvement based on integration of new technology with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.												
S53 This Project evaluates and integrates technologies and representative or prototype systems that help expedite Soldier Clothing and Individual Equipment technology transition from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide a modular, integrated uniform/clothing system from skin out and head-to-toe. It funds efforts to transition new technologies and domestically available fabrics with Flame Resistant (FR), moisture wicking, insect protection and camouflage technologies, including integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army			Date: March 2023							
Appropriation/Budget Activity	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development									
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	arctic environments. New technologies are identified to monitor health and improve Soldier survivability, reduce weight, and improve affordability, mobility and comfort in combat and training/administrative environments. Includes integration and interface on the Soldier system.									
S54 The Small Arms Improvement Advanced Component Development and Prototypes (ACD&P) program provides funds to mature, demonstrate, test and evaluate emerging technology from Budget Activity (BA) 3 Program Element 0603607A Joint Service Small Arms Program (JSSAP) Project 627 Defense Advanced Research Projects Agency (DARPA), Department of Energy National Laboratories, Research Development & Engineering Centers (RDECs) and other domestic and foreign sources for small arms weapon systems and technology. Small arm weapon systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include the maturing of technology through testing and evaluation of sub-system or system prototypes which demonstrates light weight materials, wear resistant/protective/anti-reflective coatings, observation/situational awareness improvements, human-systems integration, robotic armament capability, non-lethal capability, and equipment enhancements. Benefits include continuous improvements to small arms weapon systems, fire control equipment, optics, gun barrels, training devices, suppressors, component mounts, weapon mounts, and weapon/ammunition interface. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body and weapons.										
VS4 This Project supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Personal Protective Equipment (PPE) technology transition from the laboratory to operational use.										
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total					
Previous President's Budget	25.925	25.971	28.265	-	28.265					
Current President's Budget	25.288	23.444	27.681	-	27.681					
Total Adjustments	-0.637	-2.527	-0.584	-	-0.584					
• Congressional General Reductions	-	-								
• Congressional Directed Reductions	-	-2.500								
• Congressional Rescissions	-	-								
• Congressional Adds	-	-								
• Congressional Directed Transfers	-	-								
• Reprogrammings	-0.637	-								
• SBIR/STTR Transfer	-	-								
• Adjustments to Budget Years	-	-	-0.584	-	-0.584					
• FFRDC Transfer	-	-0.027	-	-	-					
Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2022	FY 2023								
Project: S53: Clothing And Equipment										

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions) Congressional Add: <i>Congressional Add for Multi-spectral Signature Management</i>		FY 2022 FY 2023
	Congressional Add Subtotals for Project: S53	4.500 -
		4.500 -
Project: S54: Small Arms Improvement Congressional Add: <i>New Weapon Systems Congressional Add</i>		
	Congressional Add Subtotals for Project: S54	4.000 -
		4.000 -
	Congressional Add Totals for all Projects	8.500 -
Change Summary Explanation Decreased funding to support higher Army priorities.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
CF2: <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	-	2.963	3.831	3.688	-	3.688	3.728	3.988	4.030	4.075	0.000	26.303	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
Develop and maintain a PEO Soldier Futures Strategy ICW the Soldier Lethality Cross Functional Team and all DEVCOM Centers laying out a road-map for the Army of 2040 and beyond to execute Multi Domain Operations.													
Prototype capabilities for evaluation and integration. Execute evaluation of new measurements and methodologies from the S&T community, execute system level evaluation environments, and support Soldier system modeling. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Integrated Soldier Systems Prototyping													
Description: Develop and maintain a PEO Soldier Futures Strategy ICW the Soldier Lethality Cross Functional Team and all DEVCOM Centers laying out a road-map for the Army of 2040 and beyond to execute Multi Domain Operations. Provide prototyping capabilities for evaluation and integration. Execute evaluation of new measurements and methodologies from the S&T community, execute system level evaluation environments, and support Soldier system modeling. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team.													
FY 2023 Plans: Continue to develop components, algorithms, and demonstrations in support of Squad as an Integrated Combat Platform.													
FY 2024 Plans: Continue to update the synchronized PEO Soldier futures plan and execute prototype integration demonstrations in support of Squad as an Integrated Combat Platform.													
FY 2023 to FY 2024 Increase/Decrease Statement: Funding decreases between FY23 and FY24 due to anticipated changes in requirements													
Title: SBIR/STTR Transfer													
Description: Funding transferred in accordance with Title 15 USC §638													
FY 2023 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)					
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC §638							FY 2022	FY 2023	FY 2024			
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638.												
Accomplishments/Planned Programs Subtotals							2.963	3.831	3.688			
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024	Base	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• CF3: <i>Integrated Soldier Systems (SL CFT)</i>	4.211	4.403	4.407	-	4.407	4.451	4.544	4.591	4.642	0.000	31.249	
Remarks												
D. Acquisition Strategy PEO Soldier ICW the Soldier Lethality Cross Functional Team and DEVCOM Centers will develop a synchronized road-map of future programs to progress through S&T to programs of record to be developed, produced and fielded to the Army in support of Multi Domain Operations. In support of this Futures Strategy, execute component and system level evaluations in the Soldier Integration Facility and support Soldier system modeling.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.140		-		-		-	0.000	0.140	-	
Subtotal				-	-	0.140		-		-		-	0.000	0.140	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Adaptive Squad Architecture (ASA)	C/FFP	Various : Various	1.305	0.607	Jan 2022	1.275	Jan 2023	1.135	Jan 2024	-		1.135	Continuing	Continuing	Continuing	
Soldier Modernization Plan Development	Option/ CPFF	Natick ACC : Natick MA	-	-		0.900		0.945		-		0.945	0.000	1.845	-	
Subtotal				1.305	0.607	2.175		2.080		-		2.080	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
ASA Test & Eval	C/FFP	Various : various	3.022	2.356	Dec 2021	1.141	Jan 2023	1.196	Jan 2024	-		1.196	Continuing	Continuing	Continuing	
Soldier Integration Facility Evaluations	C/CPFF	Natick ACC : Natick MA	-	-		0.375		0.412		-		0.412	0.000	0.787	-	
Subtotal				3.022	2.356	1.516		1.608		-		1.608	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				4.327	2.963		3.831		3.688		-		3.688	Continuing	Continuing	N/A
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)							Project (Number/Name)										
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development							CF2 / Integrated Soldier Systems Prototyping (SL CFT)										
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028							
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
ASA Implementation																					
Soldier Modernization Plan Development																					
Soldier Integration Facility Evaluations																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)		
Schedule Details				
Events	Start	End	Quarter	Year
ASA Implementation	2	2020	4	2028
Soldier Modernization Plan Development	1	2023	4	2028
Soldier Integration Facility Evaluations	2	2020	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) ET8 / Personnel Airdrop System Development				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
ET8: Personnel Airdrop System Development	-	1.113	1.853	2.208	-	2.208	0.932	2.311	2.336	2.363	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
A. Mission Description and Budget Item Justification													
Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. Project ET8, Personnel Airdrop System Development, improves Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvement based on integration of new technology with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier equipment. It will continue to support cross-service initiatives to improve commonality.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Personnel Airdrop System Development													
Description: Improve Low Altitude and High Altitude personnel parachutes and ancillary equipment that supports airborne operations to include canopy improvements based on integration of new technology with the goal of enhancing the insertion and safety of the airborne soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.													
FY 2023 Plans: Continue evaluation of Low Altitude Static Line Reserve Parachute Automatic Activation Devices. Mature form factor and operational concepts in addition to initial integration testing with the T-11 Reserve Single Pin.													
FY 2024 Plans: Continue integration testing of the Low Altitude Static Line Reserve Parachute Automatic Activation Device (SLRPAAD) to mature technology of product to enter Developmental Testing (DT). Evaluate technology for next generation parachutes, detecting towed jumper within the parachute system, and parachutists' ancillary safety equipment.													
FY 2023 to FY 2024 Increase/Decrease Statement: Increased funding supports increased scope of testing for the Low Altitude Static Line Reserve Parachute Automatic Activation Device (SLRPAAD).													
Title: SBIR/STTR Transfer													
Description: Funding transferred in accordance with Title 15 USC 638.													
FY 2023 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023					
Appropriation/Budget Activity			R-1 Program Element (Number/Name)			Project (Number/Name)									
2040 / 4			PE 0603827A / Soldier Systems - Advanced Development			ET8 / Personnel Airdrop System Development									
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023	FY 2024					
Funding transferred in accordance with Title 15 USC 638.															
FY 2023 to FY 2024 Increase/Decrease Statement:															
Funding transferred in accordance with Title 15 USC 638.															
Accomplishments/Planned Programs Subtotals								1.113	1.853	2.208					
C. Other Program Funding Summary (\$ in Millions)															
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost				
• ES9: Advanced Tactical Parachute System	1.705	3.029	2.776	-	2.776	3.732	4.070	4.114	4.160	0.000	23.586				
• MA7801: Advanced Tactical Parachute System	34.959	42.444	39.279	-	39.279	36.044	33.201	33.218	33.247	0.000	252.392				
Remarks															
D. Acquisition Strategy															
Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Level (TRL) 6-7) to system development and demonstration (SDD).															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development						Project (Number/Name) ET8 / Personnel Airdrop System Development				
Management Services (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.068		-		-		-	0.000	0.068	-	
Subtotal				-	-	0.068		-		-		-	0.000	0.068	N/A	
Product Development (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Developmental Contracts	C/FFP	TBD : TBD	0.955	0.392		0.633		0.780		-		0.780	2.588	5.348	-	
Engineering Support	MIPR	DEVCOM-SC : Natick, MA	0.576	0.020		0.223		0.240		-		0.240	0.827	1.886	-	
Subtotal				1.531	0.412		0.856		1.020		-		1.020	3.415	7.234	N/A
Support (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	Allot	PM SCIE : Belvoir	0.745	0.424		0.171		0.188		-		0.188	0.811	2.339	-	
Subtotal				0.745	0.424		0.171		0.188		-		0.188	0.811	2.339	N/A
Test and Evaluation (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Test and Evaluation	MIPR	TBD : TBD	0.764	0.277		0.758		1.000		-		1.000	0.782	3.581	-	
Subtotal				0.764	0.277		0.758		1.000		-		1.000	0.782	3.581	N/A
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				3.040	1.113		1.853		2.208		-		2.208	5.008	13.222	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army							Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development			Project (Number/Name) ET8 / Personnel Airdrop System Development			
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks									

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023						
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)											
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				ET8 / Personnel Airdrop System Development											
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Evaluate Component and Subsystem Technologies																			
Towed Jumper Detection System (TJDS)																			
Low Altitude Static Line Reserve Parachute Automatic Act...																			
High Altitude Insertion Enhancements																			
Static Line Parachute System Enhacements																			

Note

High Altitude Insertion Enhancements includes the following: Glide Technology, Situational Awareness Aids, and GPS Denied Navigation Aid.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) ET8 / Personnel Airdrop System Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Evaluate Component and Subsystem Technologies	1	2019	4	2023
Towed Jumper Detection System (TJDS)	1	2024	4	2024
Low Altitude Static Line Reserve Parachute Automatic Activation Device (SLRPAAD)	3	2020	4	2024
High Altitude Insertion Enhancements	1	2024	4	2028
Static Line Parachute System Enhacements	1	2025	4	2027

Note

Note: Towed Jumper Detection System (TJDS) formerly known as Advanced Universal Static Line (AUSL).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S53 / Clothing And Equipment				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
S53: Clothing And Equipment	-	6.431	3.078	4.700	-	4.700	8.150	8.790	8.884	8.982	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
A. Mission Description and Budget Item Justification													
Funding in this effort supports the Army's Cross Functional Teams (CFT) initiatives to evaluate and integrate technologies and prototypes that expedite Product Manager Soldier Clothing and Individual Equipment (PM SCIE) technology transitions from the laboratory to operational use. Efforts focus on achieving commonality across all services to provide footwear, uniforms and clothing systems consisting of all layers required to accommodate Warfighters in all environments resulting in Soldier as an integrated system. PM SCIE efforts include female Warfighter specific items and sizing. This effort funds the transition of new, improved technologies and domestically available fabrics with capabilities such as Flame Resistance (FR), moisture wicking, vector protection and innovative multi-service efforts to advance camouflage technologies to mitigate multi-spectral signature detection. This effort also funds integration of fabrics for uniforms and equipment for use in all environments focusing on arctic and jungle. PM SCIE will transition capabilities from our Science and Technology partners to increase performance of Warfighter clothing and equipment and identify emerging technologies to integrate smart textile capabilities into combat uniforms and equipment. Additional advances in existing technologies to improve survivability by focusing on reducing weight and improving performance, mobility and comfort. PM SCIE will continue to support multi-service commonality initiatives through technology that enables combat operations in a gender integrated fighting force.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024
Title: Soldier Uniforms and Clothing Description: Develop superior and sustainable integrated clothing and footwear for the Soldier in a rapidly changing global environment.											1.561	2.208	3.410
FY 2023 Plans: Supports opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines and Coast Guard) and further supports the domestic Clothing and Textile Industrial Base. Evaluate fabric and system designs that provide improved vector protection, enhanced camouflage and identification capability, Flame Resistant (FR) protection and improved comfort for inclusion in tactical and environmental clothing. Focus on improvements for cold weather and extreme cold weather clothing and handwear. Transition government developed materials that meet SWIR requirement and reduces costs across all Services. Develop enhanced Aircrew uniforms utilizing enhanced, domestically available FR fabrics. Investigate and evaluate conductive textiles (fabric level). Supports The Chief of Staff Army's directives resulting from the Army Uniform Board held twice annually to include upgrades to clothing bag items. Transition materials to reduce spectral as well as thermal signature to further mitigate detection.													
FY 2024 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S53 / Clothing And Equipment	
B. Accomplishments/Planned Programs (\$ in Millions) Supports opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines and Coast Guard) and further supports the domestic Clothing and Textile Industrial Base. Evaluate transitioned fabric and system designs that provide improved vector protection, enhanced concealment and identification capability, Flame Resistant (FR) protection and improved comfort for inclusion in tactical and environmental clothing. Focus on improvements for cold weather and extreme cold weather clothing and handwear. Transition to system development and demonstration government developed materials that meet Signature Management requirements, to include enhance Identification of Friend or Foe (IFF) and reduction of costs across all Services. Transition functional textiles to mitigate Ground Surveillance Radar (GSR) detection by opposing forces. Develop enhanced uniforms utilizing enhanced, domestically available FR fabrics. Transition materials that will improve breathability for dismounted Soldiers and reduce spectral and thermal signature to further mitigate detection. Investigate and evaluate e-textiles (fabric level). Transition materials that will protect against emerging microwave threats. Evaluate transitioned fabric and designs for the next generation cold weather clothing system. Supports The Chief of Staff Army's directives resulting from the Army Uniform Board held twice annually to include upgrades to clothing bag items.	FY 2022	FY 2023	FY 2024
FY 2023 to FY 2024 Increase/Decrease Statement: Funding increases between FY23 and FY24 due to increased focus on signature management.			
Title: Individual Equipment Description: Develop and provide superior and sustainable integrated individual equipment for the Soldier in a rapidly changing global environment.	0.370	0.758	1.290
FY 2023 Plans: Supports opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines and Coast Guard) and further supports the domestic Clothing and Textile Industrial Base. Perform laboratory testing on novel materials to support Cold Weather Equipment programs. Evaluate current load carriage equipment to assess its ability to support the modernization of current individual weapons and situational awareness capabilities. Continue to optimize the capability of Load Carriage items to support modernization of weapons and tactical equipment. Evaluate new technology to effectively camouflage and reduce thermal signature on exposed skin (face, neck, hands, etc.) and enhance individual equipment camouflage. Investigate new technology for the desalination of salt water as part of the Individual Water Treatment Device program.			
FY 2024 Plans: Supports opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines and Coast Guard) and further supports the domestic Clothing and Textile Industrial Base. Perform laboratory testing on novel materials to support Cold Weather Equipment programs and enhanced load management systems. Evaluate current load carriage equipment to assess its ability to support the modernization of current individual weapons and situational awareness capabilities. Continue to optimize the			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S53 / Clothing And Equipment							
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2022	FY 2023				
capability of Load Carriage items to support modernization of weapons and tactical equipment. Evaluate new technology for the desalination of salt water as part of the Individual Water Treatment Device program.														
FY 2023 to FY 2024 Increase/Decrease Statement: Funding increases between FY23 and FY24 due to anticipated increased requirements in Load Carriage items.														
Title: SBIR/STTR Transfer									-	0.112				
Description: Funding transferred in accordance with Title 15 USC 638										-				
FY 2023 Plans: Funding transferred in accordance with Title 15 USC 638														
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638														
Accomplishments/Planned Programs Subtotals									1.931	3.078				
Congressional Adds Subtotals									4.500	-				
Congressional Add: Congressional Add for Multi-spectral Signature Management									FY 2022	FY 2023				
FY 2022 Accomplishments: Mature, incorporate and demonstrate infrared sensor detection mitigation technology into combat uniforms, body armor and operational clothing & individual equipment by building and conducting large scale field tests of subsystem and system prototypes in relevant environments. Transition the mature materiel solutions into combat uniforms to mitigate detection by opposing forces.									4.500	-				
Congressional Adds Subtotals									4.500	-				
C. Other Program Funding Summary (\$ in Millions)														
Line Item	FY 2022	FY 2023	FY 2024	Base	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028				
• S60: Clothing & Equipment	5.196	6.313	3.427	-	3.427	3.427	6.364	8.879	8.974	9.074				
• OMA - CFF-OMA 121018: OMA SCIE 121018	-	-	-	-	-	-	-	-	-	0.000				
Cost To Complete														
Total Cost														
48.227														
Remarks														

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
D. Acquisition Strategy Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Level (TRL) 6-7) to Systems Development and Demonstration. This Project continues to exercise competitively awarded contracts using best value source selection procedures.	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S53 / Clothing And Equipment							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	TBD	PM SCIE : Ft. Belvoir, VA	16.363	0.909		0.265		0.480		-		0.480	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.112		-		-		-	0.000	0.112	-
Subtotal		16.363	0.909		0.377		0.480		-		0.480	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	NSRDEC : Natick, MA	18.450	1.514		0.785		1.110		-		1.110	Continuing	Continuing	Continuing
Development Contracts	C/FFP	Various : Various	37.595	1.516		0.565		0.973		-		0.973	Continuing	Continuing	Continuing
Subtotal		56.045	3.030		1.350		2.083		-		2.083	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support Costs	MIPR	Natick, MA : Natick, MA	9.310	0.820		0.415		0.653		-		0.653	Continuing	Continuing	Continuing
Subtotal		9.310	0.820		0.415		0.653		-		0.653	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing Costs	MIPR	Various : Various	29.692	1.672		0.936		1.484		-		1.484	Continuing	Continuing	Continuing
Subtotal		29.692	1.672		0.936		1.484		-		1.484	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S53 / Clothing And Equipment					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	111.410	6.431	3.078		4.700		-		4.700	Continuing	Continuing	N/A
<u>Remarks</u>												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				S53 / Clothing And Equipment									
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027	FY 2028
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1
UNIFORM CLOTHING																	
Flame Resistant Clothing Improvements																	
Improve Signature Mgmt Infraed (IR) Eval & Camo in Cloth...																	
Cold Weather/ Extreme Cold Weather (CW/ECW) Clothing Imp...																	
Cold Weather/ Extreme Cold Weather (CW/ECW) Handwear																	
Novel Materials Development																	
INDIVIDUAL EQUIPMENT																	
Multi-purpose Personal Hydration System (MPHS) Shelf-lif...																	
Develop Water Treatment Device																	
Thermal Signature Reduction																	
Load Carriage																	

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S53 / Clothing And Equipment

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UNIFORM CLOTHING	1	2010	4	2028
Flame Resistant Clothing Improvements	1	2012	4	2024
Improve Signature Mgmt Infared (IR) Eval & Camo in Clothing & Equipment	2	2012	4	2028
Cold Weather/ Extreme Cold Weather (CW/ECW) Clothing Improvements	1	2019	4	2025
Cold Weather/ Extreme Cold Weather (CW/ECW) Handwear	1	2020	4	2024
Novel Materials Development	1	2020	4	2028
INDIVIDUAL EQUIPMENT	4	2015	4	2025
Multi-purpose Personal Hydration System (MPHS) Shelf-life Extension Evaluation	1	2019	4	2028
Develop Water Treatment Device	1	2022	4	2026
Thermal Signature Reduction	1	2021	4	2028
Load Carriage	1	2020	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
S54: Small Arms Improvement	-	10.659	9.248	9.094	-	9.094	9.183	9.184	9.281	9.384	0.000	66.033	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Arms Improvement Advanced Component Development and Prototypes (ACD&P) program provides funds to mature, demonstrate, test and evaluate emerging technology from Budget Activity (BA) 3 Program Element (PE) 0603607A Joint Service Small Arms Program (JSSAP) Project 627 Defense Advanced Research Projects Agency (DARPA), Department of Energy National Laboratories, Research Development & Engineering Centers (RDECs) and other domestic and foreign sources for small arms weapon systems and technology. Small Arms Improvement supports the Army Modernization priorities (Build a More Lethal Force) through enhancement of Joint Lethality in contested environments by minimizing and eliminating erosion of close combat capability relative to peer competitors in complex terrain as outlined in the National Defense Strategy (NDS). Small Arms weapon systems include weapons ranging up to 40 millimeter in caliber, recoilless rifles and remote weapon stations. Current and future efforts focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include the maturing of technology through testing and evaluation of sub-system or system prototypes which demonstrates light weight materials, wear resistant/protective/anti-reflective coatings, observation/situational awareness improvements, human-systems integration, robotic armament capability, non-lethal capability, and equipment enhancements. Benefits include continuous improvements to small arms weapon systems, remote weapon systems, fire control equipment, optics, gun barrels, training devices, suppressors, component mounts, weapon mounts, ancillary items and weapon/ammunition interface. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body and weapons.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: New Weapon Systems	0.336	0.870	1.000
Description: Development of new small arms weapon systems.			
FY 2023 Plans: Advanced Technologies for Machine Gun: Will conduct market research, evaluations, trade studies and assessments for new Medium Machine Gun technologies to address capability needs. These technologies may include, but are not limited to, novel recoil mitigation, alternative lightweight materials, barrel technologies, suppressor technologies, mounting and fire control interfaces.			
New Weapons and Enabling Technology Evaluation and Assessments: Will continue to perform initial and follow-on evaluations, assessments and integration of new weapons to include various new weapon system platforms.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S54 / Small Arms Improvement			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
Advanced Technologies for Machine Gun: Will conduct market research, evaluations, trade studies and assessments for new Medium Machine Gun technologies to address capability needs. These technologies may include, but are not limited to, novel recoil mitigation, alternative lightweight materials, barrel technologies, suppressor technologies, mounting and fire control interfaces. Will develop and build test fixture for evaluation of various weapons' recoil profiles to facilitate measuring operating mechanism kinematics and transmitted recoil.					
New Weapons and Enabling Technology Evaluation and Assessments: Will continue to perform initial and follow-on evaluations, assessments and integration of new weapons to include various new weapon system platforms.					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase in efforts to support market research, evaluations, trade studies and assessments for future Medium Machine Gun technologies.					
Title: Small Arms Weapon Systems Enhancements Description: Enhancements and development of small arms weapon systems. FY 2023 Plans: Small Business Innovative Research (SBIR) Enhancements will continue future efforts to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons. Enhanced System for Remote Weapon Stations & Kinetic Counter-Unmanned Aerial System (UAS) Weapons will down select to a candidate Inertial Navigation System (INS) and integrate it to the Common Remotely Operated Weapon Station (CROWS) to demonstrate enhanced CROWS overall spatial environment awareness and improve accuracy in slewing to targets provided from external remote sources. i.e. off-board radar systems in support of network lethality operation. Continue software development and integration to include Counter Unmanned Aerial System (CUAS) kinetic defeat functionality into the CROWS Baseline Tech Refresh Software. Continue integration of prototype slip rings to the CROWS system. Engineering and environmental level testing of enhanced slip ring. Smart Rail System Controller and Remote will continue to integrate different components together and then demonstrate its ability to control devices and manage data traffic. The completion of this effort will provide a path for future capability growth to systems such as, but not limited to Next Generation Squad Weapon Fire Control, Fire Control for M3E1 Multi-purpose Anti-armor Anti-personnel Weapon System (MAAWS), and Family of Weapon Sights - Individual (FWS-I). This effort will be critical in ensuring we					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S54 / Small Arms Improvement		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
don't have duplicative hardware on weapon systems as well as ensuring the devices on the weapons can properly communicate with each other.				
Power and Data Integration onto Open Architecture Accessory Rails will continue to integrate power and data capability in a negative space rail system. This will have potential applicability to systems such as, but not limited to Next Generation Squad Weapon-Rifle/Automatic Rifle, Precision Sniper Rifle, and Next Generation Medium/Heavy Machine Gun.				
Weapon Enhancements for Improved Ammunition will continue to enhance weapons as ammunition is improved.				
New Weapons and Enabling Technology Evaluations and Assessments will continue to assess and evaluate selected capabilities and improvements for all current and legacy weapon systems.				
FY 2024 Plans: Small Business Innovative Research (SBIR) Enhancements will continue future efforts to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.				
Enhanced System for Remote Weapon Stations & Kinetic Counter-Unmanned Aerial System (UAS) Weapons will begin development of enhanced sensor packages to improve target identification range. This program will also continue software development to integrate Counter Unmanned Aerial System (CUAS) kinetic defeat functionality into the CROWS Baseline Technology Refresh Software. In addition, it will continue development of hardware solutions to expand system power and data capacity to accommodate integration of future effectors.				
Power and Data Enabled Rail (PDER) (formerly Power and Data Integration onto Open Architecture Accessory Rails) will continue to integrate power and data capability in a negative space rail system. This will have potential applicability to systems such as, but not limited to Next Generation Squad Weapon-Rifle/Automatic Rifle, Precision Sniper Rifle, and Next Generation Medium/Heavy Machine Gun, Family of Weapon Sights and STORM.				
Weapon Enhancements for Improved Ammunition will continue to enhance weapons as ammunition is improved.				
New Weapons and Enabling Technology Evaluations and Assessments will continue to assess and evaluate selected capabilities and improvements for all current and legacy weapon systems.				
FY 2023 to FY 2024 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S54 / Small Arms Improvement	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
Increased from FY 2023 to FY 2024 due to a focus on continued software development to integrate Counter Unmanned Aerial System (CUAS) kinetic defeat functionality into the CROWS Baseline Technology Refresh Software.			
Title: Combat Optics Description: Improvement of small arms combat optics. FY 2023 Plans: Advanced Combat Optics will continue to integrate current and emerging target acquisition component technologies such as, but not limited to rifle optics, binoculars and variable magnification spotting scopes. Will continue to evaluate state of the art advances in optical component technologies for inclusion in future combat optic products. FY 2024 Plans: Advanced Combat Optics will continue to integrate current and emerging target acquisition component technologies such as, but not limited to rifle optics, binoculars and variable magnification spotting scopes. Will continue to evaluate state of the art advances in optical component technologies for inclusion in future combat optic products.		0.050	0.050
Title: Fire Control Description: Small arms fire control. FY 2023 Plans: Next Generation Weapons/Enhancements will continue to support technology development for future Next Generation Weapon variants addressing operational force needs for increased lethality, increased probability of hit, increased soldier acceptance, decreased signature, reduced recoil, reduced soldier aim error, and reduced engagement time. New weapons may be variants or enhancements of the Next Generation Squad Weapon Rifle (XM5) and Next Generation Squad Automatic Rifle (XM250) or new weapon platforms to fulfill other roles such as machine guns, sniper rifles, and others. Next Generation and Fire Control Technology Enhancements will continue to support technology integration with Next Generation Weapons addressing soldier aim error, engagement time, probability of hit, situational awareness, lethality, and soldier acceptance. Iterative prototyping will be utilized to develop component technologies to support future variants of the Next Generation Squad Weapon. Technology may include enhanced camera based technology, target tracking, automatic target detection, increased networked lethality, reduced signature, increased user acceptance, along with other emerging weapon, ammunition, and fire control technologies that will increase the lethality of the next generation squad weapons. Small Arms Fire Control Enhancements will continue research test and evaluation efforts on laser based wind sensors, proof-of-concept devices, and other optical designs for prototypes that incorporate fire control sensors and ballistic solver software and		4.072	4.922
			3.040

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S54 / Small Arms Improvement	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
integration of sensor input and communication with ammunition for all small arms weapon platforms. The purpose of this effort is to evaluate downrange wind sensing technologies for incorporation into future fire control systems. Downrange wind sensing is the largest unmeasured variable remaining in ballistic calculation.			
FY 2024 Plans: Next Generation Weapons/Enhancements will continue to support technology development for future Next Generation Weapon variants addressing operational force needs for increased lethality, increased probability of hit, increased soldier acceptance, decreased signature, reduced recoil, reduced soldier aim error, and reduced engagement time. New weapons may be variants or enhancements of the Next Generation Squad Weapon Rifle (NGSW Rifle) and Next Generation Squad Automatic Rifle or new weapon platforms to fulfill other roles such as machine guns, sniper rifles, and others. Next Generation and Fire Control Technology Enhancements will continue to support technology integration with Next Generation Weapons addressing soldier aim error, engagement time, probability of hit, situational awareness, lethality, and soldier acceptance. Iterative prototyping will be utilized to develop component technologies to support future variants of the Next Generation Squad Weapon. Technology may include enhanced camera based technology, target tracking, automatic target detection, increased networked lethality, reduced signature, increased user acceptance, along with other emerging weapon, ammunition, and fire control technologies that will increase the lethality of the next generation squad weapons. Small Arms Fire Control Enhancements will continue research test and evaluation efforts on laser based wind sensors, proof-of-concept devices, and other optical designs for prototypes that incorporate fire control sensors and ballistic solver software and integration of sensor input and communication with ammunition for all small arms weapon platforms. The purpose of this effort is to evaluate downrange wind sensing technologies for incorporation into future fire control systems. Downrange wind sensing is the largest unmeasured variable remaining in ballistic calculation.			
FY 2023 to FY 2024 Increase/Decrease Statement: Decreased from FY 2023 to FY 2024 as fire control technologies are being integrated into the XM157 program.			
Title: Research and Analysis Description: Research and analysis of small arms.	0.050	0.050	0.050
FY 2023 Plans: Will continue Market Research and Benefit Analysis of new weapons and enabling technology evaluations and assessments to include, but not limited to 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research to include new technologies in emerging robotic and aerial armaments.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023							
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement												
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024					
Will continue Market Research and Benefit Analysis of new weapons and enabling technology evaluations and assessments to include, but not limited to 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research to include new technologies in emerging robotic and aerial armaments.											-	0.338	-					
Title: SBIR/STTR Transfer Description: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) FY 2023 Plans: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)											-	6.659	9.248	9.094				
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) from FY23 to Fy24 due to tax for FY24 not established.																		
Accomplishments/Planned Programs Subtotals											FY 2022	FY 2023						
Congressional Add: New Weapon Systems Congressional Add FY 2022 Accomplishments: Lightweight C-sUAS Force Protection System: Began development of the extremely lightweight and reliable externally powered weapon for arming small Unmanned Aerial Systems (sUAS). Developed schedule for integration of externally powered weapon into a small UAS, including performance of engineering and operational testing, and demonstration of armed sUAS capability for destroying enemy SUAS and providing force protection.											4.000	-						
Congressional Adds Subtotals											4.000	-						
C. Other Program Funding Summary (\$ in Millions)												Cost To Complete	Total Cost					
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost						
• EW4: Crew Served Weapons Engineering Development	8.854	7.458	4.300	-	4.300	3.772	4.074	4.116	4.162	0.000	36.736							
• FF2: Small Arms Fire Control	6.752	8.179	10.050	-	10.050	4.966	4.971	5.025	5.081	0.000	45.024							
• FM4: Next Generation Squad Weapons	13.103	17.616	16.141	-	16.141	11.058	11.072	11.191	11.316	0.000	91.497							
• S63: Individual Weapons Engineering Development	3.518	3.956	3.549	-	3.549	3.510	3.791	3.830	3.873	0.000	26.027							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development						Project (Number/Name) S54 / Small Arms Improvement	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• FL4: Small Caliber Ammo for Next Gen Squad Weapons	27.336	25.558	11.809	-	11.809	11.931	11.945	12.073	12.208	0.000	112.860
• E06002: NEXT GENERATION COMBAT ROUND	53.459	23.523	35.896	-	35.896	38.064	70.087	70.079	70.079	Continuing	Continuing
Remarks In support of Small Arms Initial Capability and Capability Development Requirements, advanced technology of small arms weapon systems is transitioned from Joint Service Small Arms Program (JSSAP), Project 627, Program Element 0603607A, (Budget Activity 3) to Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4). After the technology is demonstrated and/or validated, the program transitions to Infantry Support Weapons, Program Element 0604601A, (Budget Activity 5) for engineering and manufacturing development.											
D. Acquisition Strategy Primary strategy is to study, develop, demonstrate and evaluate emerging technologies that ultimately lead to modernizing, enhancing and/or improving the small arms inventory.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development					Project (Number/Name) S54 / Small Arms Improvement					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	PM Soldier Lethality : Picatinny Arsenal	8.446	0.280	Mar 2022	0.357	Mar 2023	0.354	Mar 2024	-		0.354	Continuing	Continuing	Continuing
SBIR/STTR Transfer	FFRDC	Army Budget Office : Pentagon, Washington DC	0.282	-		0.338		-		-		-	Continuing	Continuing	Continuing
Subtotal			8.728	0.280		0.695		0.354		-		0.354	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	MIPR	DEVCOM AC : Multiple	57.697	8.061	Mar 2022	5.833	Jun 2023	5.640	Mar 2024	-		5.640	Continuing	Continuing	Continuing
Subtotal			57.697	8.061		5.833		5.640		-		5.640	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	DEVCOM AC : Multiple	32.453	1.128	Mar 2022	1.433	Mar 2023	1.600	Mar 2024	-		1.600	Continuing	Continuing	Continuing
Subtotal			32.453	1.128		1.433		1.600		-		1.600	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	MIPR	Army Test and Evaluation Centers, : Multiple	21.375	1.190	Mar 2022	1.287	Jun 2023	1.500	Mar 2024	-		1.500	Continuing	Continuing	Continuing
Subtotal			21.375	1.190		1.287		1.500		-		1.500	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development			Project (Number/Name) S54 / Small Arms Improvement							
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	120.253	10.659		9.248		9.094		-		9.094	Continuing	Continuing	N/A
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023								
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)												
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development					S54 / Small Arms Improvement												
Event Name		FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		FY 2028		
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NEW WEAPON SYSTEMS																					
Advanced Technologies for Machine Gun																					
New Weapons and Enabling Technology Evaluation and Ass																					
Lightweight C-sUAS Force Protection System																					
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS																					
Advanced Small Unit Technology																					
Non-Standard Weapon Assessments																					
Weapon Enhancements for Improved Ammunition																					
Smart Rail System Controller and Remote																					
Power and Data Enabled Rail (PDER)																					
Formerly Power and Data Integration onto Open Architecture Accessory Rails																					
Enhanced System for Remote Weapon Stations & Kinetic Co																					
Small Business Innovative Research																					
New Weapons and Enabling Technology Evaluations and Ass																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023							
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
COMBAT OPTICS																				
Advanced Combat Optics																				
FIRE CONTROL																				
Small Arms Fire Control Enhancements																				
Formerly Small Arms Fire Control -Precision/Enhancements																				
Next Generation and Fire Control Technology Enhancements																				
RESEARCH AND ANALYSIS																				
Research and Analysis of Small Arms																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S54 / Small Arms Improvement

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NEW WEAPON SYSTEMS	1	2008	4	2028
Advanced Technologies for Machine Gun	1	2022	4	2028
New Weapons and Enabling Technology Evaluation and Assessments	1	2020	4	2028
Lightweight C-sUAS Force Protection System	1	2022	4	2022
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS	1	2008	4	2028
Advanced Small Unit Technology	1	2021	4	2022
Non-Standard Weapon Assessments	1	2020	4	2022
Weapon Enhancements for Improved Ammunition	1	2023	4	2024
Smart Rail System Controller and Remote	1	2021	4	2024
Power and Data Enabled Rail (PDER)	1	2021	4	2024
Enhanced System for Remote Weapon Stations & Kinetic Counter-UAS Weapons	1	2020	4	2028
Small Business Innovative Research	1	2015	4	2028
New Weapons and Enabling Technology Evaluations and Assessments	1	2020	4	2028
COMBAT OPTICS	1	2008	4	2028
Advanced Combat Optics	1	2020	4	2028
FIRE CONTROL	1	2008	4	2028
Small Arms Fire Control Enhancements	1	2017	4	2024
Next Generation and Fire Control Technology Enhancements	1	2019	4	2028
RESEARCH AND ANALYSIS	1	2012	4	2028
Research and Analysis of Small Arms	1	2015	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0603827A / Soldier Systems - Advanced Development				VS4 / Soldier Protective Equipment				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
VS4: Soldier Protective Equipment	-	4.122	5.434	7.991	-	7.991	7.988	7.994	8.076	8.166	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams' (CFT) initiatives. This Project supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Personal Protective Equipment (PPE) technology transition from the laboratory to operational use. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and protective equipment. Project supports the Secretary of the Army's directive to identify opportunities for commonality across all Services (Army, Navy, Air Force, Marines, and Coast Guard).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: Soldier Protective Equipment (SPE)	4.122	5.236	7.991
Description: Effort to increase Warfighter survivability and mobility by optimizing Soldier protection while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).			
FY 2023 Plans:			
With emerging innovations in materials and manufacturing, project will build on previously developed Technology/Maturation and Risk Reduction efforts across the PPE portfolio: Torso and Extremity Protection (TEP); Vital Torso Protection (VTP); Integrated Head Protection System (IHPS); Next Generation (NG) IHPS, and Military Protective Eyewear Systems to support SPS requirements for lighter-weight ballistic materials with improved performance and manufacturing/ testing process improvements. Product Management Office will evaluate current and future material, processing upgrades, and inform stakeholders of new operational capabilities. These new future materials may come from S&T transitions, like Novel Fabric for Torso Protection. The Program will incorporate the new capabilities into SPS designs as appropriate. The Program will continue efforts to increase form, fit, and function of body armor for all Soldiers regardless of size and gender. The Program will also continue to develop conformal body armor and equipment to better accommodate female Soldiers. Maintain development initiatives to increase durability, shelf life, and functional service life of existing personal protective systems at the subsystem/component level. Continue the development of improved measurement, evaluation, and testing processes for existing systems and emerging requirements. Initiate Head Protection efforts to pursue Durable Anti-fog Coatings for Combat Eye Protection and Transparent Surfaces. Product office will begin efforts to update gender geometric anatomy into models, such as Operational Requirements-based Casualty Assessment, to inform designs, sizing, and variations development and improvements to support Department of Defense (DoD) Soldier protection needs.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) VS4 / Soldier Protective Equipment			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
The project will build on previously developed Technology/Maturation and Risk Reduction efforts across the PPE portfolio to support SPS requirements for lighter-weight ballistic materials with improved performance and manufacturing/ testing process improvements. In FY24, the program office will coordinate with the S&T community with efforts such as Novel Fabric for Torso Protection, Novel Defeat Mechanisms, Fragmentation uniform protective materials, Hearing Protection, Eye Protection Anti-Scratch Coating, and Improved Blunt Impact Protection.					
Product Management Office will evaluate current and future material, processing upgrades, and inform stakeholders of new operational capabilities. The program will continue developing conformal body armor and equipment to better accommodate female soldiers. In FY24, the program will continue efforts to update gender geometric anatomy into models, such as Operational Requirements-based Casualty Assessment, to inform designs, sizing, and variations development and improvements to support Department of Defense (DoD) Soldier protection needs.					
Hard Armor protection efforts will leverage technical testing on prototypes of single plate transitioning designed to defeat multiple threats with low weight. Head Protection efforts will include technology transitioning for anti-fog capability and its applicability on the battlefield and test eyewear film that reduces the occurrence of scratches and allows for self-healing of the lenses.					
Overarching efforts for this program will be to maintain development initiatives to increase durability, shelf life, and functional service life of existing personal protective systems at the subsystem/ component level. Continue the development of improved measurement, evaluation, and testing processes for existing systems and emerging requirements. Program Office will develop, and test prototype assets built with materials and methodologies transitioning from S&T community.					
FY 2023 to FY 2024 Increase/Decrease Statement: Funding change in Soldier Protective Equipment portfolio is due to anticipated requirement changes in FY 2024 that result in an increase level of effort to address improved materials and emerging threats.			-	0.198	-
Title: SBIT/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638.					
FY 2023 Plans: Funding transferred in accordance with Title 15 USC 638.					
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638.					
Accomplishments/Planned Programs Subtotals			4.122	5.434	7.991

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) VS4 / Soldier Protective Equipment				
C. Other Program Funding Summary (\$ in Millions)												
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• VS5: Soldier Protective Equipment • OMA - 121 - 12101700/ RJSI: Soldier Modernization - Soldier Protection Systems	8.837	9.303	8.150	-	-	8.150	8.710	8.712	8.800	8.899	0.000	61.411

Remarks**D. Acquisition Strategy**

Programs pursue technology transition from science and technology, maturation, and prototype development, culminating in the transition of mature technologies (Technology Readiness Levels (TRL) 6-7) to Engineering and Manufacturing Development. This Project continues to exercise competitively awarded contracts using best value source selection procedures where applicable.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) VS4 / Soldier Protective Equipment								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	Allot	PM SSV Various : Various	3.928	0.798		0.472		1.805		-		1.805	Continuing	Continuing	Continuing	
SBIR/STTR Transfer	TBD	Continuing : To Be Determined	-	-		0.198		-		-		-	Continuing	Continuing	Continuing	
Subtotal		3.928	0.798		0.670			1.805		-		1.805	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Dev/Sys Engineering Spt	MIPR	CCDC-SC : Natick, MA	9.952	0.500		1.664		1.522		-		1.522	Continuing	Continuing	Continuing	
Dev/Integ Contracts	TBD	CCDC-SC : Natick, MA	80.108	2.190		1.225		2.700		-		2.700	Continuing	Continuing	Continuing	
Subtotal		90.060	2.690		2.889			4.222		-		4.222	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Ballistic/Blast/Nonballistic Testing	MIPR	Various : Various	19.531	0.634		1.875		1.964		-		1.964	Continuing	Continuing	Continuing	
Subtotal		19.531	0.634		1.875			1.964		-		1.964	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			113.519	4.122		5.434		7.991		-		7.991	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023														
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development							Project (Number/Name) VS4 / Soldier Protective Equipment																	
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SPS Technology Upgrade Insertion					SPS Technology Upgrade Insertion																							
VTP Technology Upgrade Insertion					VTP Technology Upgrade Insertion																							
TEP Technology Upgrade Insertion					TEP Technology Upgrade Insertion																							
Military Protective Eyewear Systems Improvement					Military Protective Eyewear Systems Improvement																							
Helmet Technology Upgrade Insertion					Helmet Technology Upgrade Insertion																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) VS4 / Soldier Protective Equipment

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SPS Technology Upgrade Insertion	1	2018	4	2028
VTP Technology Upgrade Insertion	1	2021	4	2028
TEP Technology Upgrade Insertion	1	2021	4	2028
Military Protective Eyewear Systems Improvement	1	2023	4	2028
Helmet Technology Upgrade Insertion	1	2021	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604017A / Robotics Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	78.309	26.555	3.024	-	3.024	3.033	3.037	3.069	3.103	0.000	120.130
CF4: Robotic Combat Vehicle (RCV) NGCV-CFT	-	75.661	26.555	-	-	-	-	-	-	-	0.000	102.216
FD9: Robotics Systems	-	2.648	-	3.024	-	3.024	3.033	3.037	3.069	3.103	0.000	17.914

Note

In Fiscal Year (FY) 2024, the funding in PE 0604017A/ Robotics Development, CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT (BA4) transitions to Program Element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle NGCV-CFT (BA5)

A. Mission Description and Budget Item Justification

This Program Element contains multiple projects. CF4: Robotic Combat Vehicle (RCV) NGCV-CFT and FD9: Robotic Systems.

CF4: Robotic Combat Vehicle (RCV) NGCV- CFT: The Robotic Combat Vehicle (RCV) development efforts will produce unmanned ground combat vehicle prototypes to aid Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTP) development, integrate and secure advanced autonomy and artificial intelligence algorithms, and inform follow-on production and fielding decisions. RCV will transition from Manned Unmanned Teaming (MUM-T) experimentation to deliberate hardware and software focused development programs to include a RCV Light (L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

RCV Experimentation, which concluded in 4Q FY2022, included initial hardware and software integration as well as Soldier Operational Experiments (SOE) to train, test, and evaluate the ability of Soldiers to perform missions using Mission Enabling Technology-Demonstrators (METDs) and Robotic Combat Vehicles (RCVs). Information gathered from the SOEs will be used to further inform MUM-T and which RCV(L) capabilities to develop.

To solicit early Soldier feedback, the RCV(L) MTA Rapid Prototyping program will be accomplished through two complimentary lines of effort (LOE) - Surrogate Prototypes (SP) and Full System Prototypes (FSP). The RCV(L) Surrogate Prototypes (SP) LOE utilizes updated RCV experimental prototypes and new build SPs in an iterative design-upgrade-test approach that includes integration of a Minimum Viable Capability Release (MVCR) and follow-on Capability Releases (CR) from the RCV Software Acquisition Pathway (SWP) program. The SP LOE includes annual design-upgrade-test cycles, each culminating in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE. The RCV(L) Full System Prototypes (FSP) LOE will leverage mature capabilities from previous RCV experimentation and SP development efforts and integrate additional embedded software, perception sensors, user control interfaces, and communication links that will permit autonomous movement, tele-op movement, and increased battlefield situational awareness.

The Robotic Combat Vehicle (RCV) Software Acquisition Pathway (SWP) focuses on embedded software development and sustainment activities including RCV autonomy software, control station software, and payload control software. The RCV SWP will provide software capabilities to the Surrogate Prototypes (SP) and Full

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	
System Prototype (FSP) LOEs for integration. The RCV SWP will incorporate Soldier and integrator feedback into product roadmaps to guide the development and maturation of critical software capabilities.		
The total cost of the RCV(L) MTA Rapid Prototyping program is \$508.3 million (then-year dollars) RDT&E from FY 2022 to FY 2027. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.		
Robotic Combat Vehicle (RCV) funding in this program element directly aligns with the Next Generation Combat Vehicle (NGCV) Army Modernization Priority. There is no funding request in PB 2024 as the program continues development and transitions from PE 0604017A/ Robotics Development, CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT (BA4) to Program Element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.		
FD9: Robotics Systems: Program Office Robotics Development (RD) improves robotic and autonomous program acquisition schedules and facilitating quicker delivery of emerging technology to warfighters by supporting the development of integrated and synchronized capability documents (e.g. JCIDS, Department Directed, etc.) and by maturing / transitioning robotics technology. Research Development Technology Evaluation (RDTE) funds enable support to capability development of emerging requirements. Activities include studies, assessments, and document development such as Technology Readiness Levels, Manufacturing Readiness Levels, Analysis of Alternatives / Letter of Sufficiency determinations, draft acquisition documents, and draft contract documents. Efforts include robotics and autonomous systems technology maturation / transition from Science & Technology (S&T) projects and Robotic Enhancement Program (REP) initiatives, Milestone Decision Documentation (MDD), and activities leading up to formal program initiation at Milestone B or C. The acquisition activities conducted under this line intend to reduce acquisition cost, schedule, and performance risk by conducting market surveys, technical risk assessments, developing performance specifications, scopes of work, acquisition strategies, systems engineering plans, test and evaluation master plans, lifecycle sustainment plans, engaging in early test planning, and prototype development activities. This line is for large robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits.		
FY 2024 funding will expand Modeling and Simulation (M&S) including Continuous Autonomy Simulation Test Laboratory Environment (CASTLE) capability to test and evaluate Manned Unmanned teaming, combat scenarios or other emerging Robotics requirement needs. RD funding will utilize the M&S environment to mature and evaluate S&T for inclusion to program requirements, Engineering Change Proposals (ECPs) and/or technical insertions, utilize gaming technology in conjunction with Autonomy Software to develop Training, Tactics and Procedures (TTPs), requirements and Concepts of Operations (CONOPS). Funding supports Program management activities including inter-service support, travel, conducting Analysis of Alternatives (AoA), draft performance specifications, prototype demos, acquisition documents, payload demos, future payload maturation for Robotic Platforms and pre-MS B activities.		
Funding also supports modernization of the current Ground Robotic fleets and current Army vehicles by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding will also support developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts. Funds will be utilized for infrastructure to support cloud based tools for development and deployment of Autonomy and Artificial Intelligence/ Machine Learning (AI/ML) software.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604017A / Robotics Development			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	80.525	26.594	3.088	-	3.088
Current President's Budget	78.309	26.555	3.024	-	3.024
Total Adjustments	-2.216	-0.039	-0.064	-	-0.064
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.216	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.064	-	-0.064
• FFRDC Transfer	-	-0.039	-	-	-
Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2022	FY 2023			
Project: CF4: Robotic Combat Vehicle (RCV) NGCV-CFT					
Congressional Add: RCV Medium	20.000	-			
	20.000	-			
	20.000	-			
Congressional Add Subtotals for Project: CF4					
Congressional Add Totals for all Projects					
	20.000	-			

Change Summary Explanation

Decreased funding to support higher Army priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / Robotics Development				Project (Number/Name) CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CF4: Robotic Combat Vehicle (RCV) NGCV-CFT	-	75.661	26.555	-	-	-	-	-	-	-	0.000	102.216
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
In Fiscal Year (FY) 2024, the funding in PE 0604017A/ Robotics Development, CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT (BA4) transitions to Program Element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle NGCV-CFT (BA5)

A. Mission Description and Budget Item Justification

The Robotic Combat Vehicle (RCV) development efforts will produce unmanned ground combat vehicle prototypes to aid Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTP) development, integrate and secure advanced autonomy and artificial intelligence algorithms, and inform follow-on production and fielding decisions. RCV will transition from Manned Unmanned Teaming (MUM-T) experimentation to deliberate hardware and software focused development programs to include a RCV Light (L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

RCV Experimentation, which concluded in 4Q FY2022, included initial hardware and software integration as well as Soldier Operational Experiments (SOE) to train, test, and evaluate the ability of Soldiers to perform missions using Mission Enabling Technology-Demonstrators (METDs) and Robotic Combat Vehicles (RCVs). Information gathered from the SOEs will be used to further inform MUM-T and which RCV(L) capabilities to develop.

To solicit early Soldier feedback, the RCV(L) MTA Rapid Prototyping program will be accomplished through two complimentary lines of effort (LOE) - Surrogate Prototypes (SP) and Full System Prototypes (FSP). The RCV(L) Surrogate Prototypes (SP) LOE utilizes updated RCV experimental prototypes and new build SPs in an iterative design-upgrade-test approach that includes integration of a Minimum Viable Capability Release (MVCR) and follow-on Capability Releases (CR) from the RCV Software Acquisition Pathway (SWP) program. The SP LOE includes annual design-upgrade-test cycles, each culminating in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE. The RCV(L) Full System Prototypes (FSP) LOE will leverage mature capabilities from previous RCV experimentation and SP development efforts and integrate additional embedded software, perception sensors, user control interfaces, and communication links that will permit autonomous movement, tele-op movement, and increased battlefield situational awareness.

The Robotic Combat Vehicle (RCV) Software Acquisition Pathway (SWP) focuses on embedded software development and sustainment activities including RCV autonomy software, control station software, and payload control software. The RCV SWP will provide software capabilities to the Surrogate Prototypes (SP) and Full System Prototype (FSP) LOEs for integration. The RCV SWP will incorporate Soldier and integrator feedback into product roadmaps to guide the development and maturation of critical software capabilities.

The total cost of the RCV(L) MTA Rapid Prototyping program is \$508.3 million (then-year dollars) RDT&E from FY 2022 to FY 2027. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / Robotics Development	Project (Number/Name) CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT	
Robotic Combat Vehicle (RCV) funding in this program element directly aligns with the Next Generation Combat Vehicle (NGCV) Army Modernization Priority. There is no funding request in PB 2024 as the program continues development and transitions from PE 0604017A/ Robotics Development, CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT (BA4) to Program Element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: RCV Experimentation - Development Engineering Description: RCV Experimentation Development Engineering encompasses initial hardware and software design and integration of RCV technologies, to include network, autonomy, sensors, aided target recognition, hostile fire detection and location, and pre-shot detection. RCV Experimentation Development Engineering also includes development or capabilities informed by Soldier feedback during Soldier Operational Experiments (SOE). RCV Experimentation Development Engineering is performed by the U.S. Army Combat Capabilities Development Command (DEVCOM) Ground Vehicle Systems Center (GVSC), DEVCOM Armaments Center (AC), DEVCOM Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center, and RCV contractors.	21.670	-	-
Title: RCV Experimentation - Testing and Evaluation Description: Test and Evaluation includes Experimental Prototype and Surrogate Prototype (SP) shakedown testing, safety and performance testing at Government test sites, and the spares parts and technical support to execute Soldier Operational Experiments (SOE) using Experimental Prototypes. The SOEs will solicit Soldier feedback, inform new doctrine for manned/unmanned teaming based operations, validate user requirements, and aid in determination of capabilities ready for incorporation into future RCV designs and software releases.	11.967	-	-
Title: RCV Experimentation - Modeling and Simulation Description: RCV Modeling and Simulation effort will produce the ability to experiment in a virtual environment to conduct data collection and results that will inform the physical testing learning objectives. This will provide the initial data set to inform the operational experimentation in the RCV Campaign of Learning as well as feed initial data to the Requirements Community as they build new MUM-T, CONOPS and Tactics, Techniques, and Procedures (TTP). As test data is collected, high fidelity simulations for unmanned operation of combat platforms will be refined in a virtual test environment to enable virtual test - fix - test cycles in a virtual developmental space.	0.950	-	-
Title: Surrogate Prototype (SP) - Product Development Description: Engineering design and development of the Surrogate Prototypes (SPs), to include integration of software capability updates from the Software Acquisition Pathway (SWP) line of effort. SP Product development also includes the design and integration of improvements for safety, cybersecurity, perception sensors, and reliability to support the Soldier user experiments	9.641	23.360	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 4	PE 0604017A / Robotics Development	CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022	FY 2023	FY 2024
and modeling and simulation (M&S) efforts. Additionally, SP Product Development provides engineering support to prototype build, in addition to on-site Field Service Representative (FSR) support and new equipment training (NET) for all phases of SP testing.					
FY 2023 Plans: FY 2023 SP Product Development includes Ground Vehicle Systems Center (GVSC), QinetiQ, and Textron engineering design efforts for user interfaces, autonomy integration, and perception upgrades. Additionally, FY 2023 SP Product Development includes GVSC engineering support to an initial United States Army Forces Command (FORSCOM) Pilot, and OEM technical support and spare parts for Government testing.					
FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in funding from FY 2023 to FY 2024 is due to transition to Budget Activity 5. The program funding continues in Program Element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.					
Title: Software Acquisition Pathway (SWP) - Software Engineering Development			5.401	-	-
Description: Software Acquisition Pathway (SWP) Software Engineering Development focuses on embedded software development and sustainment activities including Robotic Combat Vehicle (RCV) autonomy software, control station software, payload control software, and cybersecurity hardening. SWP Software Engineering Development will deliver annual software capability releases (CR) to both the Surrogate Prototype (SP) and Full System Prototype (FSP) lines of effort. Developed software will also be delivered to the SWP systems integration laboratory (SIL) for live and virtual software testing.					
Title: Program Management			6.032	2.226	-
Description: Government project management to RCV development programs. Includes salaries, travel, training, supplies, facilities, and equipment.					
FY 2023 Plans: Government engineering, financial management, acquisition planning, risk assessment and mitigation, contract management, and operations support necessary to manage Surrogate Prototyping efforts. Includes salaries, training, travel, supplies, facilities, and equipment.					
FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in FY 2024 is due to transition of Program Management for RCV(L) Surrogate Prototypes (SP) build, RCV(L) Full Systems Prototypes (FSP), Software Acquisition Pathway (SWP) efforts to program element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.					
Title: SBIR/STTR Transfer			-	0.969	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023	
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604017A / Robotics Development				Project (Number/Name) CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2022	FY 2023	FY 2024		
<p>Description: Requirements to support Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program.</p> <p>FY 2023 Plans: Requirements to support Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638</p>											
Accomplishments/Planned Programs Subtotals							55.661	26.555	-		
<p>Congressional Add: RCV Medium</p> <p>FY 2022 Accomplishments: RCV Medium build and refurbishment, development engineering, and support to testing.</p>						FY 2022	FY 2023				
						20.000	-				
Congressional Adds Subtotals						20.000	-				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 0604641A: <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	-	109.849	142.125	-	142.125	142.354	142.518	144.039	145.645	0.000	826.530
Remarks											
Robotic Combat Vehicle Light (RCV(L)) development and RCV Software Acquisition Pathway (SWP) efforts are continued in program element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.											
D. Acquisition Strategy											
RCV development includes an RCV(L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.											
<p>RCV(L) Acquisition Strategy: On 10 February 2022, the Army Acquisition Executive (AAE) approved the execution of RCV(L) Rapid Prototyping effort under authorities granted by under authorities granted under Section 804 of the 2016 NDAA (PL 114-92). The RCV(L) MTA Rapid Prototyping effort will be accomplished in two complementary lines of effort (LOE), Surrogate Prototypes (SP) and Full System Prototypes (FSP).</p>											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> <i>NGCV-CFT</i>
<p>The SP LOE will utilize an existing Other Transaction Authority (OTA) task assignment with QinetiQ North America to both update existing RCV experimental prototypes to Surrogate Prototype configuration as well as procure new build Surrogate Prototypes. The Surrogate Prototypes will support annual design-upgrade-test cycles that include FORSCOM operational pilots to collect Soldier feedback and demonstrate improved capabilities related to autonomous software, system safety, and cyber and spectrum resiliency. Each design-upgrade-test cycle will culminate in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE.</p> <p>The FSP acquisition strategy includes a full and open competition that will select up to four vendors to deliver prototype demonstrators to inform down select to a single vendor for prototype build. Developmental testing of FSPs will include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, and Electromagnetic Environmental Effects (E3) testing. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be executed to evaluate system suitability and effectiveness.</p> <p>Upon successful completion of the RCV(L) Rapid Prototyping effort, an MTA Outcome Determination (OD) will determine if the program will transition to a MTA Rapid Fielding effort aimed at fielding RCV(L) FSPs to selected unit(s) for Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policies (DOTMLPF-P) analysis and integration of Manned-Unmanned Teaming (MUM-T) operations.</p> <p>Software Acquisition Pathway (SWP) Acquisition Strategy: The SWP Acquisition Decision Memorandum (ADM), signed 3 August 2021, directs the use of the draft Cross Functional Team (CFT) Next Generation Combat Vehicle (NGCV) Robotic and Optionally Manned Autonomous (ROMA) Capabilities Needs Statement (CNS) as the base user capabilities document from which to derive capabilities for the RCV SWP. The RCV SWP will provide government furnished software to RCV SP and FSP efforts. The RCV SWP will implement a Government - Contractor hybrid development approach to mature, integrate, and secure software capabilities from the science and technology base. The RCV SWP will incorporate software contracting best practices to support the transition of software capabilities into secure code base required for the resilient operation of RCVs in contested environments. On 25 January 2023, the AAE approved Software Acquisition Pathway entrance into the Execution Phase.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604017A / Robotics Development				Project (Number/Name) CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management	MIPR	Various : Various	13.938	6.032	Oct 2021	2.226	Nov 2022	-	-	-	-	-	0.000	22.196	-	
SBIR/STTR Transfer	Various	Various : Various	-	-		0.969	Jan 2023	-	-	-	-	-	0.000	0.969	-	
Subtotal		13.938	6.032		3.195								0.000	23.165	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Development Engineering	Various	GVSC; Various : Warren, MI; Various	22.461	36.712	Dec 2021	23.360	Nov 2022	-	-	-	-	-	0.000	82.533	-	
RCV Medium	SS/FFP	Textron Systems; Howe & Howe : Hunt Valley, MD; Waterboro, ME	-	20.000	Feb 2023	-	-	-	-	-	-	-	0.000	20.000	-	
Subtotal		22.461	56.712		23.360								0.000	102.533	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Modeling and Simulation	MIPR	GVSC; Various : Warren, MI; Various	4.119	0.950	Jan 2022	-	-	-	-	-	-	-	0.000	5.069	-	
Testing and Evaluation	MIPR	Various : Various	29.601	11.967	Dec 2021	-	-	-	-	-	-	-	0.000	41.568	-	
Subtotal		33.720	12.917		-	-	-	-	-	-	-	-	0.000	46.637	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			70.119	75.661		26.555		-		-		-	0.000	172.335	N/A	
Remarks																
FY 2023 funding for Development Engineering supports Surrogate Prototype Product Development efforts.																

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army							Date: March 2023		
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604017A / Robotics Development			Project (Number/Name) CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT			
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
FY 2023 Program Management efforts include Government engineering, financial management, acquisition planning, risk assessment and mitigation, contract management, and operations support necessary to manage Surrogate Prototype Product Development.									

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

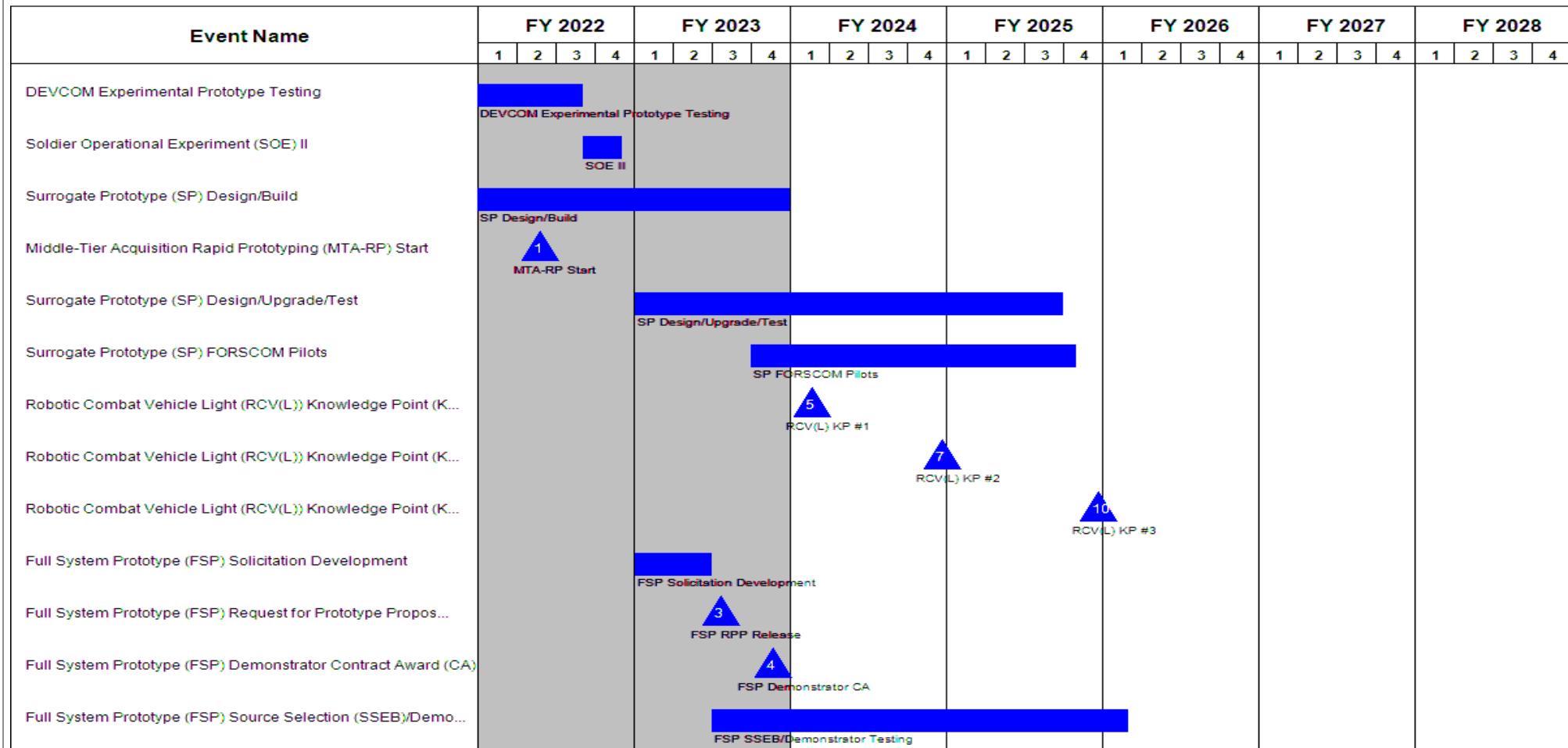
Appropriation/Budget Activity

2040 / 4

R-1 Program Element (Number/Name)

PE 0604017A / Robotics Development

Project (Number/Name)

CF4 / Robotic Combat Vehicle (RCV)
NGCV-CFT

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

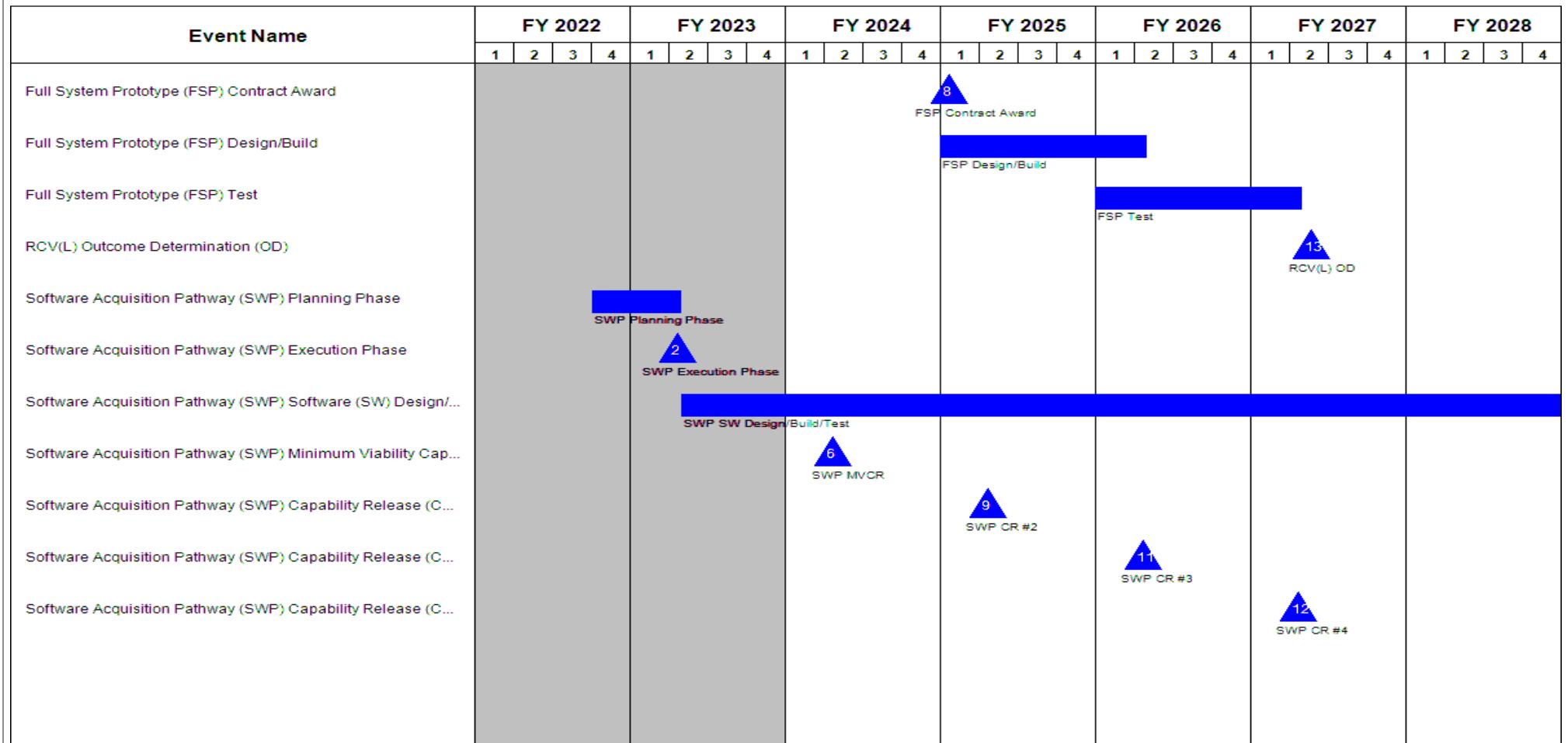
2040 / 4

R-1 Program Element (Number/Name)

PE 0604017A / *Robotics Development*

Project (Number/Name)

CF4 / Robotic Combat Vehicle (RCV)
NGCV-CFT



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> <i>NGCV-CFT</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DEVCOM Experimental Prototype Build	1	2021	2	2021
DEVCOM Experimental Prototype Testing	3	2021	3	2022
Soldier Operational Experiment (SOE) II	3	2022	4	2022
Surrogate Prototype (SP) OTA Contract Development/Modification	2	2021	4	2021
Surrogate Prototype (SP) Contract Build #1	4	2021	4	2021
Surrogate Prototype (SP) Design/Build	4	2021	4	2023
Middle-Tier Acquisition Rapid Prototyping (MTA-RP) Start	2	2022	2	2022
Surrogate Prototype (SP) Design/Upgrade/Test	1	2023	3	2025
Surrogate Prototype (SP) FORSCOM Pilots	4	2023	4	2025
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #1	1	2024	1	2024
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #2	4	2024	4	2024
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #3	4	2025	4	2025
Full System Prototype (FSP) Solicitation Development	1	2023	2	2023
Full System Prototype (FSP) Request for Prototype Proposal (RPP) Release	3	2023	3	2023
Full System Prototype (FSP) Demonstrator Contract Award (CA)	4	2023	4	2023
Full System Prototype (FSP) Source Selection (SSEB)/Demonstrator Testing	3	2023	1	2026
Full System Prototype (FSP) Contract Award	1	2025	1	2025
Full System Prototype (FSP) Design/Build	1	2025	2	2026
Full System Prototype (FSP) Test	1	2026	2	2027
RCV(L) Outcome Determination (OD)	2	2027	2	2027
Software Acquisition Pathway (SWP) Planning Phase	4	2022	2	2023
Software Acquisition Pathway (SWP) Execution Phase	2	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / Robotics Development	Project (Number/Name) CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT		
Events	Start		End	
	Quarter	Year	Quarter	Year
Software Acquisition Pathway (SWP) Software (SW) Design/Build/Test	2	2023	4	2028
Software Acquisition Pathway (SWP) Minimum Viability Capability Release (MVCR)	2	2024	2	2024
Software Acquisition Pathway (SWP) Capability Release (CR) #2	2	2025	2	2025
Software Acquisition Pathway (SWP) Capability Release (CR) #3	2	2026	2	2026
Software Acquisition Pathway (SWP) Capability Release (CR) #4	2	2027	2	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / Robotics Development				Project (Number/Name) FD9 / Robotics Systems				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
FD9: Robotics Systems	-	2.648	-	3.024	-	3.024	3.033	3.037	3.069	3.103	0.000	17.914	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

Program Office Robotics Development (RD) improves robotic and autonomous program acquisition schedules by supporting the development of integrated and synchronized capability documents (e.g. JCIDS, Department Directed, etc.) and by maturing / transitioning technology. Research Development Technology Evaluation (RDTE) funds enable support to capability development of emerging requirements. Activities include studies, assessments, and document development such as Technology Readiness Levels, Manufacturing Readiness Levels, Analysis of Alternatives / Letter of Sufficiency determinations, draft acquisition documents, and draft contract documents. Efforts include robotics and autonomous systems technology maturation / transition from Science & Technology (S&T) projects and Robotic Enhancement Program (REP) initiatives, Milestone Decision Documentation (MDD), and activities leading up to formal program initiation at Milestone B or C. The pre-acquisition activities conducted under this line intend to reduce acquisition cost, schedule, and performance risk by conducting market surveys, technical risk assessments, developing performance specifications, scopes of work, acquisition strategies, systems engineering plans, test and evaluation master plans, lifecycle sustainment plans, engaging in early test planning, and prototype development activities. This line is for large robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits.

Funding will expand Modeling and Simulation (M&S) including Continuous Autonomy Simulation Test Laboratory Environment (CASTLE) capability to include Live/Virtual capability and to test and evaluate Manned Unmanned teaming, combat scenarios or other emerging Robotics requirement needs. RD funding will utilize the M&S environment to mature and evaluate S&T for inclusion to program requirements, Engineering Change Proposals (ECPs) and/or technical insertions, utilize gaming technology in conjunction with Autonomy Software to develop Training, Tactics and Procedures (TTPs), requirements and Concepts of Operations (CONOPS). Funding supports Program Management activities including inter-service support, travel, conducting Analysis of Alternative (AoA), draft performance specifications, prototype demos, payload demos, future payload maturation for Robotic Platforms and pre-MS B activities. Funding supports transition of legacy S&T autonomy software into the GVSC ROS and RTK repositories.

Funding also supports modernization of the current Ground Robotic fleets and current Army vehicles by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding will also support developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts. Funds will be utilized for infrastructure to support cloud based tools for development and deployment of Autonomy and Artificial Intelligence/Machine learning (AI/ML) software, tools to support automated testing of Autonomy Software in a DEVSECOPS process and transition of prior program software modules to the Robotic Technology Kernel (RTK) and Robotic Operating System (ROS) library for future reuse.

FY 2024 RDTE funds in the amount of \$3.024 million supports extending current Modeling and Simulation (M&S) for development and testing of autonomous systems. Addresses Manned/Unmanned Teams capabilities including Live/Virtual testing to reduce the number of needed physical assets and to increase safety on the test range/course. Funding will also be used to evaluate and mature Artificial Intelligence and Machine Learning (AI/ML) algorithms for potential use in future robotic programs and to develop a radio modeling capability and cyber resiliency products. . Funding supports systems engineering activities for emerging programs.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / Robotics Development	Project (Number/Name) FD9 / Robotics Systems	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2022 FY 2023 FY 2024
Title: Emerging Robotics Systems		2.648	-
Description: Validation and verification of incremental system software capability upgrades for emerging robotic requirements through M&S Software-in-the-loop (SIL) and Hardware-in-the-loop (HIL) allowing for transition into Program of Record.			3.024
FY 2024 Plans: Funds Modeling and Simulation (M&S) to support the development and test of autonomous systems. Addresses Manned/ Unmanned Teams capabilities including Live/Virtual testing to reduce the number of needed physical assets and to increase safety on the test range/course. Funding will also be used to evaluate and mature Artificial Intelligence and Machine Learning (AI/ML) algorithms for potential use in future robotic programs. Funding supports systems engineering activities for emerging programs.			
FY 2023 to FY 2024 Increase/Decrease Statement: Program not funded in FY23. FY24 will resume technology maturation and Modeling and Simulation investment to reach Army goals of fully autonomous systems.			
Accomplishments/Planned Programs Subtotals			2.648 - 3.024
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks Pre-acquisition program activities funded by this line transition to a separate Program Element and Project prior to their first program acquisition Milestone (B or C).			
D. Acquisition Strategy			
Robotics Development (RD) is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects into programs of record. It informs the acquisition process early in the development cycle allowing key stakeholders the ability to make integration decisions and affordability trades while writing requirements.			
Efforts include Capabilities Document input, close analysis of OTD activities that feed cost estimates, capture technical and test data, provide test support, develop Modeling and Simulation (M&S) capabilities, and develop a Software Integration Lab (SIL). Efforts may support Rapid prototyping to inform emerging requirements and other Army systems. A "buy/lease, try and inform" methodology may be used to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a return on investment to support future Army decision making.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center (GVSC) funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology. The Army will build, and test prototype systems for safety release, Soldier use, and further technology maturation.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army													Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / Robotics Development					Project (Number/Name) FD9 / Robotics Systems					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Integration Lab / Modeling & Simulation	MIPR	Multiple : Various	1.266	-		-		0.600	Dec 2023	-		0.600	0.000	1.866	-
VANE Development Support	MIPR	Army Corp of Engineer (ERDC) : Vicksburg, Mississippi	-	0.462	Apr 2022	-		0.300	Jan 2024	-		0.300	0.000	0.762	-
CASTLE / VANE Accreditation Support Plan and Validation	MIPR	Data Analysis Center (DEVCOM) : Aberdeen Proving Grounds, MD	-	0.519	Apr 2022	-		0.200	Jan 2024	-		0.200	0.000	0.719	-
CASTLE Autonomous System Test Capability Transition	MIPR	Software Engineering Center (GVSC) : Warren, MI	-	0.200	Jun 2022	-		-	-	-		-	0.000	0.200	-
CASTLE Radio Waveform Modeling Capability	MIPR	Software Engineering Center (GVSC) : Warren, MI	-	0.250	Feb 2022	-		-	-	-		-	0.000	0.250	-
Cybersecurity for Robotic and Autonomous Systems Hardening	MIPR	Ground Vehicle Robotics : Warren, MI	-	0.050	Mar 2023	-		0.300	Mar 2024	-		0.300	0.000	0.350	-
CASTLE Immersive Simulation Support	MIPR	Software Engineering Center (GVSC) : Warren, MI	-	0.406	Mar 2023	-		0.300	Mar 2024	-		0.300	0.000	0.706	-
CASTLE Automated Testing Development	MIPR	Software Engineering Center (GVSC) : Warren, MI	-	0.246	Mar 2023	-		0.250	Mar 2024	-		0.250	0.000	0.496	-
Automated Testing of Manned/Unmanned Teaming Ops Development	MIPR	Software Engineering Center (GVSC) : Warren, MI	-	-		-		0.300	Jan 2024	-		0.300	0.000	0.300	-
Artificial Intelligence/Machine Learning	TBD	TBS : TBD	-	-		-		0.400	Jan 2024	-		0.400	0.000	0.400	-
Subtotal			1.266	2.133		-		2.650		-		2.650	0.000	6.049	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / Robotics Development				Project (Number/Name) FD9 / Robotics Systems						
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support / Historical Efforts	MIPR	Various : Multiple locations	13.116	0.515	Oct 2021	-		0.374	Oct 2023	-		0.374	0.000	14.005	-
Subtotal			13.116	0.515		-		0.374		-		0.374	0.000	14.005	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			14.382	2.648		-		3.024		-		3.024	0.000	20.054	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army														Date: March 2023														
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604017A / Robotics Development				Project (Number/Name) FD9 / Robotics Systems																				
Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Robotics Development																												
RD MODELING & SIMULATION (M&S)																												
RD MODELING & SIMULATION (M&S) cont.																												
RD Artificial Intelligence/Machine Learning																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>	
Schedule Details			
Events	Start	End	
	Quarter	Year	Quarter
Robotics Development	1	2017	4
RD (ERP, CBRN, CRS-LR, etc.)	1	2021	4
RD MODELING & SIMULATION (M&S)	1	2017	4
RD MODELING & SIMULATION (M&S) cont.	1	2024	4
RD Artificial Intelligence/Machine Learning	1	2024	4

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604019A / Expanded Mission Area Missile (EMAM)							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	26.855	258.320	97.018	-	97.018	363.435	778.029	2,120.659	1,592.164	0.000	5,236.480
BU9: IFPC High Energy Laser	-	7.957	215.343	85.852	-	85.852	359.412	778.029	2,120.659	1,592.164	0.000	5,159.416
CO6: IFPC High Power Microwave (HPM)	-	18.898	42.977	11.166	-	11.166	4.023	-	-	-	0.000	77.064

Note

Work in this project continues from the work done under PE 0602150A (Air and Missile Defense Technology) / Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology) and PE 0603466A (Air and Missile Defense Advanced Technology) / Project AD1 (High Energy Laser Tactical Vehicle Demo Advanced Technology).

This PE supports transitioning the High Energy Laser -Tactical Vehicle Demonstration S&T effort to manufacturing combat ready rapid prototype systems for delivery and transition to Program of Record in FY 2025.

Project BU9 Indirect Fire Protection Capability (IFPC)- High Energy Laser (HEL) has been restructured to transfer all funds for IFPC-High Power Microwave (HPM) effort to Program Element (PE) 0604019A Expanded Mission Area Missile (EMAM) Project CO6 IFPC-HPM.

A. Mission Description and Budget Item Justification

These funding lines are directly aligned to the Army Air and Missile Defense Modernization Priority.

Work in this PE, the Expanded Mission Area Missile (EMAM) program, supports the Integrated Air and Missile Defense (IAMD) architecture and provides Directed Energy - Indirect Fire Protection Capability (DE-IFPC) intercept capability to defeat Cruise Missiles (CM), Unmanned Aircraft System (UAS), and Rocket, Artillery, and Mortar (RAM) threats.

The DE-IFPC is an Air Defense capability consisting of the IFPC-HEL and the IFPC-HPM. IFPC-HEL will provide a ground-based weapon system designed to acquire, track, engage, and defeat the CM, UAS, and RAM threats. The IFPC-HEL requirement consists of a vehicle, high energy laser subsystem, power and thermal subsystem, and a beam control subsystem integrated with a battle management command, control and communication software. IFPC-HEL provides much needed protection against adversarial threat systems capable of targeting U.S. and Allied forward operating bases and other critical assets.

IFPC-HPM will provide a ground-based weapon system designed to acquire, track, engage, and defeat UAS swarms. The IFPC-HPM requirement consists of a HPM source, power and thermal subsystem, and an antenna subsystem interoperable with a battle management command, control and communication software. IFPC-HPM provides much needed protection against adversarial UAS swarms capable of targeting and overwhelming U.S. and Allied air defense systems.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604019A / Expanded Mission Area Missile (EMAM)			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	27.872	220.820	144.936	-	144.936
Current President's Budget	26.855	258.320	97.018	-	97.018
Total Adjustments	-1.017	37.500	-47.918	-	-47.918
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.500			
• Congressional Rescissions	-	-			
• Congressional Adds	-	40.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.017	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-47.918	-	-47.918
Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2022	FY 2023			
Project: BU9: IFPC High Energy Laser					
Congressional Add: Program Increase: IFPC-HEL					
			Congressional Add Subtotals for Project: BU9		
			Congressional Add Totals for all Projects		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Mi- ssile (EMAM)				Project (Number/Name) BU9 / IFPC High Energy Laser				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
BU9: IFPC High Energy Laser	-	7.957	215.343	85.852	-	85.852	359.412	778.029	2,120.659	1,592.164	0.000	5,159.416	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

Note
Work in this project continues the work done under PE 0602150A (Air and Missile Defense Technology) / Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology) and PE 0603466A (Air and Missile Defense Advanced Technology) / Project AD1 (High Energy Laser Tactical Vehicle Demo Advanced Technology).
This PE supports transitioning the High Energy Laser -Tactical Vehicle Demonstration S&T effort to manufacturing combat ready rapid prototype vehicles for delivery and transition to Program of Record in FY 2025.
Project BU9 Indirect Fire Protection Capability (IFPC)- High Energy Laser TVD has been restructured to transfer all funds for IFPC-High Power Microwave (HPM) effort to Program Element (PE) 0604019A Expanded Mission Area Missile (EMAM) Project CO6 IFPC-HPM.

A. Mission Description and Budget Item Justification
This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.
The Directed Energy Indirect Fire Protection Capability (DE-IFPC) - High Energy Laser (HEL) is an Air Defense capability consisting of IFPC - HEL prototypes with residual combat capability at the IFPC Battery Level in support of Multi-Domain Operations (MDO). IFPC-HEL will provide the Army prototype weapon systems for defense of fixed and semi-fixed sites from Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats. This project will deliver an operationally effective rapid prototype capability in the near and mid-terms. Efforts will include accelerated materiel development and competitive prototyping. IFPC-HEL funds an improved mechanism to effectively confront emerging threats and advance America's military dominance in accordance with the National Defense Strategy. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs.
The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas, the Army Modernization Strategy, and supports the Army's future capability opportunities for leap-ahead technology for directed energy.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: IFPC-High Energy Laser Description: This effort will provide planning, prototype manufacturing, and testing for Indirect Fire Protection Capability (IFPC)-High Energy Laser (HEL) rapid prototypes with residual combat capability to support the IFPC mission. The IFPC-HEL is a modularized laser weapon system that can be integrated onto a Heavy Expanded Mobility Tactical Truck (HEMTT) Palletized Load System (PLS) to defend fixed and semi-fixed sites from Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and	7.957	168.943	85.852

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Missile (EMAM)	Project (Number/Name) BU9 / IFPC High Energy Laser	
B. Accomplishments/Planned Programs (\$ in Millions)			
Rocket, Artillery, and Mortar (RAM) threats delivered with residual combat capability in FY 2025 as part of the IFPC Battery in support of Multi-Domain Operations (MDO). IFPC-HEL builds on the technology maturation and demonstration from PE 0602150A (Air and Missile Defense Technology) / Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology) and PE 0603466A (Air and Missile Defense Advanced Technology) / Project AD1 (High Energy Laser Tactical Vehicle Demo Advanced Technology).		FY 2022	FY 2023
FY 2023 Plans: Will continue systems engineering, program management, engineering, and technical support, for weapon system prototyping. Fabrication will commence immediately upon contract award to include hardware, integration and assembly.			
FY 2024 Plans: Prototype fabrication will continue to include hardware integration and assembly. Will continue systems engineering, program management, engineering and technical support.			
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in funding in FY2024 is due to program activities transitioning from engineering, long lead purchases, sub-system integration; to prototype integration and delivery.			
Title: SBIR/STTR Transfer		-	6.400
Description: Funding transferred in accordance with Title 15 USC §638			-
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638			
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638			
Accomplishments/Planned Programs Subtotals			7.957 175.343 85.852
			FY 2022 FY 2023
Congressional Add: Program Increase: IFPC-HEL		-	40.000
FY 2023 Plans: This effort will complete the laboratory demonstration and the Engineering Learning Event (ELE) of the laser weapon demonstrator and inform the IFPC-HEL Prototypes.			
Congressional Adds Subtotals			- 40.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) BU9 / <i>IFPC High Energy Laser</i>
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy <p>A demonstration effort has been initiated for this capability that will culminate in an integrated laboratory demonstration in FY 2023. Given a favorable outcome, prototype weapon systems will be delivered with residual combat capability in FY 2025 as part of the IFPC Battery in support of Multi-Domain Operations (MDO). Soldier touchpoints will be conducted to provide feedback in support of Army requirements generation/soldier centered design, prototype maturation, fielding, and future capability development. Performance characteristics will be utilized to establish a Program of Record within PEO Missiles and Space.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Mi- ssile (EMAM)				Project (Number/Name) BU9 / IFPC High Energy Laser								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	Various	Various : Various	-	0.795		10.119	Dec 2022	8.547	Dec 2023	-		8.547	Continuing	Continuing	-	
SBIR/STTR Transfer	TBD	Various : Various	-	-		6.400		-		-		-	0.000	6.400	-	
Facilities, IT/Supplies, Travel, Training	TBD	Various : Various	-	-		0.135	Dec 2022	-		-		-	0.000	0.135	-	
Program Increase: IFPC-HEL Management Support	TBD	Various : Various	-	-		2.944		-		-		-	0.000	2.944	-	
Subtotal			-	0.795		19.598		8.547		-		8.547	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Systems, Development: Indirect Fire Protection Capability - High Energy Laser (IFPC-HEL)	C/CPFF	TBD : TBD	-	7.162		154.856	Jul 2023	77.305	Nov 2023	-		77.305	Continuing	Continuing	-	
Software Development and Support	MIPR	Various : Various	-	-		3.833	Feb 2023	-		-		-	0.000	3.833	-	
Program Increase: IFPC-HEL	C/CPFF	Dynetics : Huntsville, AL	-	-		37.056		-		-		-	0.000	37.056	-	
Subtotal			-	7.162		195.745		77.305		-		77.305	Continuing	Continuing	N/A	
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				-	7.957		215.343		85.852		-		85.852	Continuing	Continuing	N/A
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army

Date: March 2023

Appropriation/Budget Activity

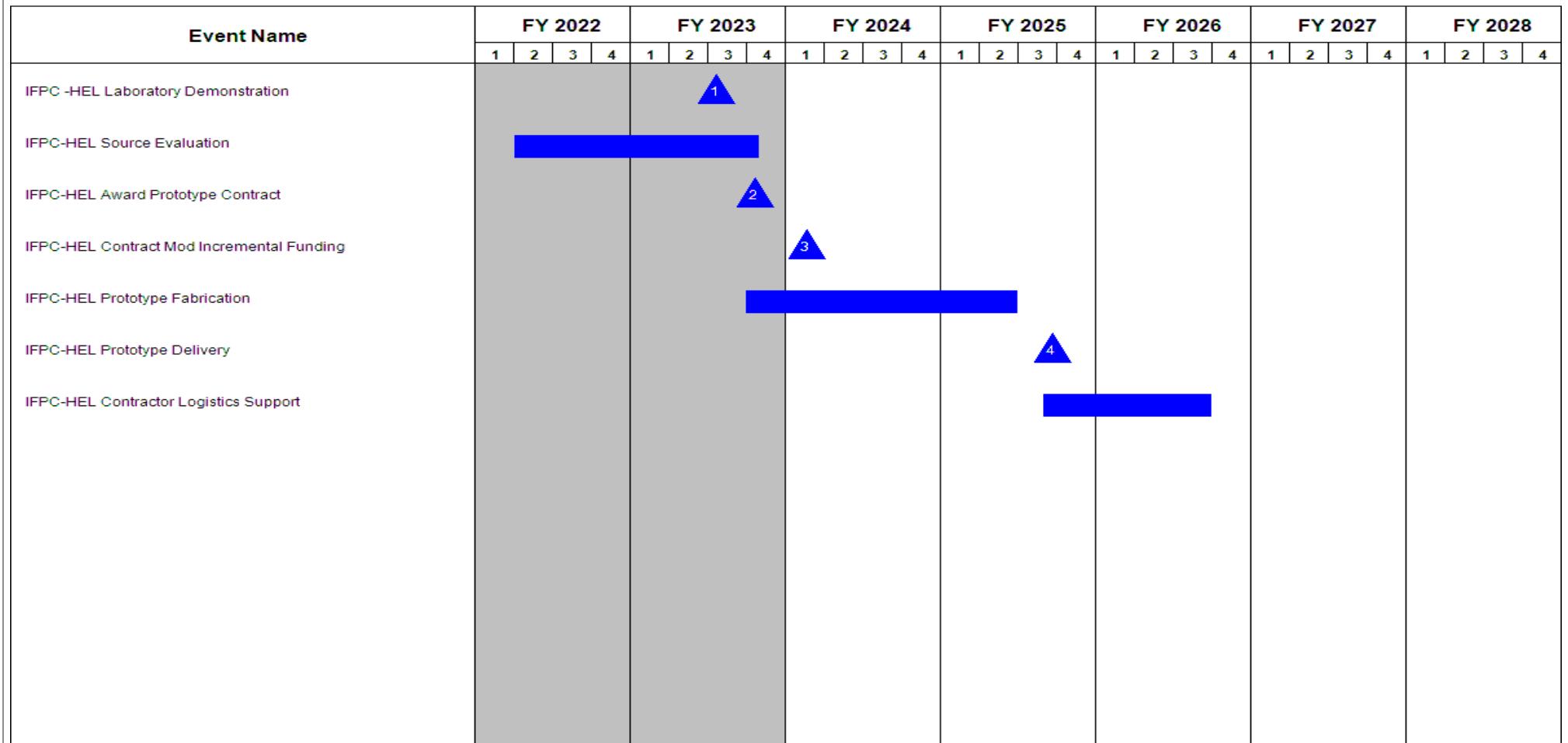
2040 / 4

R-1 Program Element (Number/Name)

PE 0604019A / Expanded Mission Area Missile (EMAM)

Project (Number/Name)

BU9 / IFPC High Energy Laser



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Mi- ssile (EMAM)	Project (Number/Name) BU9 / IFPC High Energy Laser		
Schedule Details				
Events	Start	End	Quarter	Year
IFPC -HEL Laboratory Demonstration	3	2023	3	2023
IFPC-HEL Source Evaluation	2	2022	4	2023
IFPC-HEL Award Prototype Contract	4	2023	4	2023
IFPC-HEL Contract Mod Incremental Funding	1	2024	1	2024
IFPC-HEL Prototype Fabrication	4	2023	2	2025
IFPC-HEL Prototype Delivery	3	2025	3	2025
IFPC-HEL Contractor Logistics Support	3	2025	3	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 4					PE 0604019A / Expanded Mission Area Missile (EMAM)				CO6 / IFPC High Power Microwave (HPM)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CO6: IFPC High Power Microwave (HPM)	-	18.898	42.977	11.166	-	11.166	4.023	-	-	-	0.000	77.064
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Project BU9 Indirect Fire Protection Capability (IFPC)- High Energy Laser has been restructured to transfer all funds for the IFPC-High Power Microwave (HPM) effort to Program Element (PE) 0604019A Expanded Mission Area Missile (EMAM) Project CO6 IFPC-HPM.

A. Mission Description and Budget Item Justification
This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Directed Energy - Indirect Fire Protection Capability (DE-IFPC) - High Power Microwave (HPM) is an Air Defense capability consisting of the IFPC-HPM prototype with residual combat capability at the IFPC Battery Level in support of Multi-domain Operations (MDO). IFPC-HPM will provide the Army with HPM prototype weapon systems for the short-range defense of fixed and semi-fixed sites from Unmanned Aircraft System (UAS) swarms. This project will deliver an operationally effective rapid prototype capability in the near and mid-terms. Efforts will include accelerated materiel development and prototyping. IFPC-HPM funds an improved mechanism to effectively confront emerging threats and advance America's military dominance in accordance with the National Defense Strategy. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas, the Army Modernization Strategy, and supports the Army's future capability opportunities for leap-ahead technology for directed energy.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: IFPC-High Power Microwave Description: This effort will provide development, planning, prototype manufacturing, and testing of 4 IFPC-HPM rapid prototypes with residual combat capability to support the IFPC mission. The IFPC-HPM is a weapon system that can be transported by common brigade combat team equipment to defend fixed and semi-fixed sites against Group 1-2 UAS swarms. IFPC-HPM is common with other Services and the Joint Counter-UAS Office HPM effectors for countering UAS. IFPC-HPM leverages previous HPM technology demonstrations and experimentation campaigns. FY 2023 Plans: Continuation of fabricating and producing prototypes of the common HPM system, delivering 4 prototypes in FY 2024. FY 2024 Plans:	18.898	41.408	11.166

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Missile (EMAM)	Project (Number/Name) CO6 / IFPC High Power Microwave (HPM)	
B. Accomplishments/Planned Programs (\$ in Millions) Will continue prototype fabrication, systems engineering, program management, engineering, and technical support, for weapon system prototyping. Initiate Contractor Logistics Support (CLS). FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in funding in FY 2024 is due to system integration, assembly and testing activities progressing into prototype delivery and Contractor Logistics Support.		FY 2022	FY 2023
Title: SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC §638		-	1.569
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638			-
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638			
Accomplishments/Planned Programs Subtotals		18.898	42.977
11.166			
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy DE-IFPC will utilize streamlined acquisition methods, processes and techniques to rapidly acquire the capability. Prototype Other Transactions Agreement (pOTA) will be utilized to acquire four prototype HPM systems to deliver to Soldiers NLT 4Q FY 2024. Soldier touchpoints will be conducted to provide feedback in support of Army requirements generation, prototype maturation, fielding residual combat capability to a unit of action, and future capability development.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Missile (EMAM)				Project (Number/Name) CO6 / IFPC High Power Microwave (HPM)							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	-	1.889		2.280	Dec 2022	1.112	Dec 2023	-		1.112	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.569		-		-		-	0.000	1.569	-
Facilities, IT/Supplies, Travel, Training	TBD	Various : Various	-	-		0.125	Dec 2022	-		-		-	0.000	0.125	-
Subtotal		-	1.889		3.974		1.112		-		1.112	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Indirect Fire Protection Capability - High Power Microwave (IFPC-HPM)	C/FFP	Epirus : Los Angeles, CA	-	17.009	Dec 2022	33.553	Feb 2023	9.354	Dec 2023	-		9.354	Continuing	Continuing	Continuing
Software Development and Support	MIPR	Various : Various	-	-		0.750	Feb 2023	-		-		-	0.000	0.750	-
GFE	MIPR	Various : Various	-	-		1.000	Feb 2023	-		-		-	0.000	1.000	-
Subtotal		-	17.009		35.303		9.354		-		9.354	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	Various : Various	-	-		0.700	Jun 2023	0.700	Dec 2023	-		0.700	0.000	1.400	-
Targets	MIPR	TSMO : Huntsville, AL	-	-		3.000	Mar 2023	-		-		-	0.000	3.000	-
Subtotal		-	-		3.700		0.700		-		0.700	0.000	4.400	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army									Date: March 2023			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Mi ssile (EMAM)				Project (Number/Name) CO6 / IFPC High Power Microwave (HPM)					
	Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	18.898	42.977		11.166		-		11.166	Continuing	Continuing	N/A
Remarks												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023							
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)												
2040 / 4				PE 0604019A / Expanded Mission Area Mi ssile (EMAM)				CO6 / IFPC High Power Microwave (HPM)												
Event Name	FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027	FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IFPC-HPM Contract Award					1															
IFPC-HPM Prototype Fabrication																				
IFPC-HPM Prototype Delivery													2							
IFPC-HPM Contractor Logistic Support																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) CO6 / <i>IFPC High Power Microwave (HPM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IFPC-HPM Contract Award	1	2023	1	2023
IFPC-HPM Prototype Fabrication	1	2023	4	2024
IFPC-HPM Prototype Delivery	4	2024	4	2024
IFPC-HPM Contractor Logistic Support	1	2025	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	77.000	117.557	0.000	117.557	0.000	0.000	0.000	0.000	0.000	194.557
DC8: Army Experimentation and Prototyping	-	-	77.000	117.557	-	117.557	-	-	-	-	0.000	194.557

A. Mission Description and Budget Item Justification

This Program Element (PE) is the Army led scope of the Rapid Defense Experimentation Reserve (RDER) initiative. To facilitate rapid modernization of the force, the RDER initiative was established in the Defense Planning Guidance for Fiscal Year 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify "best of breed" capabilities developed among the DoD prototyping programs and execute approved projects through large-scale experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations are to nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component - involving Joint Services, International partners and/or other government agencies - and link to one or more of the four key supporting concepts ("functional battles") of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.

Army lead experimentation outcomes will be designed to validate required capabilities enabling the JWC by evaluating and integrating prototyped technologies in operationally relevant, multi-domain environments. Experimentation results will facilitate Joint Staff analysis in the evaluation of the Joint Warfighting Concept, assist the Joint Requirements Oversight Counsel in requirements determination, and inform the Deputy's Management Action Group to make budget decisions that affect changes throughout the Department.

The cited work is consistent with the Under Secretary of Defense, Research and Engineering science and the JWC.

Work in this PE is performed by the United States (U.S.) Army and other Service laboratories and research centers, U.S. Army and Joint Program Executive Offices and Program Management Offices.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	106.000	0.000	-	0.000
Current President's Budget	0.000	77.000	117.557	-	117.557
Total Adjustments	0.000	-29.000	117.557	-	117.557
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-29.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	117.557	-	117.557
Change Summary Explanation					
Increase in FY24 supports 9 programs that expand the effort to expeditionary logistics; sensor to shooter, system integration and modeling and simulation.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				Project (Number/Name) DC8 / Army Experimentation and Prototyping				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
DC8: Army Experimentation and Prototyping	-	-	77.000	117.557	-	117.557	-	-	-	-	0.000	194.557	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
Army led programs and experimentation enable Joint All Domain Operations concepts applicable across multiple Combatant Commands (CCMD) to address OUSD R&E priority scenarios. Individual efforts bring together layered solutions to compete with peer and near-peer adversaries through the development of capabilities that support fires, command and control, logistics, and capabilities that will drive information advantage. These activities will accelerate joint warfighting capabilities to quickly demonstrate and assess innovative technologies resulting in follow-on Office of the Secretary of Defense (OSD), Army, and other Service efforts for accelerated transition of the technologies to CCMD required operations.													
The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Joint Warfighting Concepts.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2022	FY 2023	FY 2024
Title: Olympus Description: Mature technologies from Technology Readiness Level (TRL) 6 to TRL7+ prototypes for Soldier evaluations in INDOPACOM as primary experiment event in FY 2024. Efforts will include advanced capabilities for sensing, target identification / target paring, multi-layer networks / data sharing, and advanced command and control. The program portfolio will initiate prototyping, integration and risk reduction activities to facilitate integrated and interoperable capabilities that leverage layered Intelligence, Surveillance and Reconnaissance (ISR), and autonomy with advanced communications and architectures to enable Artificial Intelligence (AI)-infused analytics and Layered Effects. FY 2023 Plans: Conduct systems design, hardware procurement, systems prototyping, software maturation and systems integration for Layered ISR, autonomy systems, advanced communications, data architectures, and layered effects within the Olympus portfolio. Efforts will prototype and integrate terrestrial and aerial ISR systems for evaluation on relevant test networks for a Combatant Command relevant scenario. Advanced communications and architectures will be prototyped and integrated to assess and refine concept of employment and associated use cases within a primary risk reduction event (FY 2023) and lead into the primary experimentation event in FY 2024. FY 2023 to FY 2024 Increase/Decrease Statement: This project is fully funded with FY 2023 dollars no requested funding in FY24. Title: Army RDER 24 Program											-	74.189	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Description: The Army RDER 24 program will mature technologies to TRL7+ prototypes for a series of Soldier evaluations culminating with a CCMD assessment. Efforts will include an expeditionary fabrication capability with constrained resources, expeditionary solutions to reduce demand of logistics resupply and repair, autonomous platform solutions for logistics resupply and supporting modeling and simulation capabilities. Additional efforts focusing on base defense will include advanced fires capabilities, advanced sensing capabilities, and improvements to network, data analytics, and information distribution. The project portfolio will progress from prototyping, integration and risk reduction activities to facilitate an integrated and interoperable capability demonstration of layered solutions for logistics operations, resupply, repair, and base defense.</p> <p>FY 2024 Plans: Conduct systems design, hardware procurement, systems prototyping, software maturation and systems integration for layered solutions for logistics and base defense within the portfolio of projects. Prototype and integrate materiel and physical systems into platform delivery resupply, reduced demand, and repair solutions for evaluation in real-world environments for a CCMD relevant scenario. Prototype and integrate materiel and physical systems into sensing and fires solutions for evaluation in real-world environments for a CCMD relevant scenario. Integrate resilient communication systems and data analytics, and conduct modeling and simulation to provide interoperability within the portfolio of projects. Conduct risk reduction event for individual projects that lead into the primary CCMD operational assessment event in FY 2025.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY24 funding increase is related to the expanded capability scope covering logistics and base defense activities including an increase in the number of individual projects compared to the Olympus portfolio covering ISR activities.</p> <p>Title: SBIR & STTR Adjustment</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638</p>				
Accomplishments/Planned Programs Subtotals				- 77.000 117.557
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping
D. Acquisition Strategy N/A	Project (Number/Name) DC8 / Army Experimentation and Prototyping

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				Project (Number/Name) DC8 / Army Experimentation and Prototyping							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Olympus: Program Management and Capability Transition	TBD	Various : Various	-	-		6.178		-		-		-	0.000	6.178	-
Army 24: Program Management and Capability Transition	TBD	DEVCOM-ARL; DEVCOM-C5ISR : Various	-	-		-		13.466		-		13.466	0.000	13.466	-
SBIR & STTR Adjustment	TBD	Various : Various.	-	-		2.811		-		-		-	0.000	2.811	-
Subtotal				-	-	8.989		13.466		-		13.466	0.000	22.455	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Layered ISR and autonomy systems design	Option/ TBD	Multiple : Various	-	-		3.163		-		-		-	0.000	3.163	-
Layered ISR and autonomy systems hardware procurement	Option/ TBD	Multiple : Various	-	-		16.607		-		-		-	0.000	16.607	-
Layered ISR and autonomy systems prototyping	Option/ TBD	Multiple : Various	-	-		5.536		-		-		-	0.000	5.536	-
Layered ISR and autonomy software maturation	Option/ TBD	Multiple : Various	-	-		3.163		-		-		-	0.000	3.163	-
Layered ISR and autonomy systems integration	Option/ TBD	Multiple : Various	-	-		3.163		-		-		-	0.000	3.163	-
Communications and architectures Systems Design	C/TBD	Multiple : Various	-	-		3.954		-		-		-	0.000	3.954	-
Communications and architectures hardware procurement	Option/ TBD	Multiple : Various	-	-		7.118		-		-		-	0.000	7.118	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				Project (Number/Name) DC8 / Army Experimentation and Prototyping							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Communications and architectures systems prototyping	Option/ TBD	Multiple : Various	-	-		4.745		-		-		-	0.000	4.745	-
Communications and architectures software maturation	Option/ TBD	Multiple : Various	-	-		5.536		-		-		-	0.000	5.536	-
Communications and architectures systems integration	Option/ TBD	Multiple : Various	-	-		3.954		-		-		-	0.000	3.954	-
Lab Based Risk Reduction activities	Option/ TBD	Multiple : Various	-	-		3.954		-		-		-	0.000	3.954	-
Risk Reduction and Evaluation Events	Option/ TBD	Multiple : Various	-	-		7.118		-		-		-	0.000	7.118	-
Army 24: Expeditionary demand reduction systems	Option/ TBD	DEVCOM-C5ISR; DEVCOM-GVSC; ERDC : Various	-	-		-		14.951		-		14.951	0.000	14.951	-
Army 24: Expeditionary Repair	Option/ TBD	DEVCOM-GVSC, ERDC : Various	-	-		-		16.500		-		16.500	0.000	16.500	-
Army 24: Autonomous platform solutions	Option/ TBD	DEVCOM-SC, DEVCOM-AC : Various	-	-		-		33.522		-		33.522	0.000	33.522	-
Army 24: Advanced sensing	Option/ TBD	DEVCOM-AvMC, DEVCOM-ARL : Various	-	-		-		6.826		-		6.826	0.000	6.826	-
Army 24: Advanced fires	Option/ TBD	JPEO A&A : Various	-	-		-		15.000		-		15.000	0.000	15.000	-
Army 24: Network distribution	Option/ TBD	DEVCOM-C5ISR : Various	-	-		-		4.000		-		4.000	0.000	4.000	-
Army 24: Information distribution	Option/ TBD	DIA : Various	-	-		-		7.775		-		7.775	0.000	7.775	-
Army 24: Communication and navigation system integration	TBD	Various : Various	-	-		-		3.517		-		3.517	0.000	3.517	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army											Date: March 2023					
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				Project (Number/Name) DC8 / Army Experimentation and Prototyping								
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Army 24: Modeling and simulation support	TBD	Various : Various	-	-		-		2.000		-		2.000	0.000	2.000	-	
Subtotal				68.011		104.091				104.091		172.102	N/A			
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals				-	-	77.000		117.557		-		117.557	0.000	194.557	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)									
2040 / 4				PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				DC8 / Army Experimentation and Prototyping									
Event Name		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026		FY 2027		FY 2028			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Olympus																	
Layered ISR and autonomy systems design																	
Layered ISR and autonomy systems hardware procurement																	
Layered ISR and autonomy systems prototyping																	
Layered ISR and autonomy software maturation																	
Layered ISR and autonomy systems integration																	
Communications and architectures systems design																	
Communications and architectures hardware procurement																	
Communications and architectures systems prototyping																	
Communications and architectures software maturation																	
Communications and architectures systems integration																	
Lab Based Risk Reduction activities																	
Olympus Risk Reduction and Evaluation Event 1																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023						
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)											
2040 / 4				PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				DC8 / Army Experimentation and Prototyping											
				FY 2022				FY 2023				FY 2024				FY 2025			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Olympus Evaluation Event 2																			
Army RDER Program																			
Army RDER 24 Program																			
Army 24: Expeditionary demand reduction systems																			
Army 24: Expeditionary repair																			
Army 24: Autonomous platform solutions																			
Army 24: Modeling and simulation																			
Army 24: Communication and navigation system integration																			
Army 24: Advanced sensing																			
Army 24: Advanced fires																			
Army 24: Network distribution																			
Army 24: Information distribution																			
Army 24: Lab based risk reduction																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping		
Schedule Details				
Events	Start	End	Quarter	Year
Olympus	1	2023	4	2024
Layered ISR and autonomy systems design	1	2023	3	2023
Layered ISR and autonomy systems hardware procurement	1	2023	3	2023
Layered ISR and autonomy systems prototyping	2	2023	1	2024
Layered ISR and autonomy software maturation	2	2023	4	2024
Layered ISR and autonomy systems integration	3	2023	4	2024
Communications and architectures systems design	1	2023	3	2023
Communications and architectures hardware procurement	1	2023	3	2023
Communications and architectures systems prototyping	2	2023	1	2024
Communications and architectures software maturation	2	2023	4	2024
Communications and architectures systems integration	3	2023	4	2024
Lab Based Risk Reduction activities	1	2023	4	2024
Olympus Risk Reduction and Evaluation Event 1	4	2023	4	2023
Olympus Evaluation Event 2	4	2024	4	2024
Army RDER Program	1	2023	4	2024
Army RDER 24 Program	1	2024	4	2025
Army 24: Expeditionary demand reduction systems	1	2024	4	2025
Army 24: Expeditionary repair	1	2024	4	2025
Army 24: Autonomous platform solutions	1	2024	4	2025
Army 24: Modeling and simulation	1	2024	4	2025
Army 24: Communication and navigation system integration	1	2024	4	2025
Army 24: Advanced sensing	1	2024	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army				Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping			
Events	Start		End		
	Quarter	Year	Quarter	Year	
Army 24: Advanced fires	1	2024	4	2025	
Army 24: Network distribution	1	2024	4	2025	
Army 24: Information distribution	1	2024	4	2025	
Army 24: Lab based risk reduction	1	2024	4	2024	
Army 24: Risk reduction event	3	2024	1	2025	
Army 24: Evaluation event	2	2025	4	2025	
Army 24: Final Evaluation	4	2025	4	2025	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604035A / Low Earth Orbit (LEO) Satellite Capability								
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
Total Program Element	-	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing	Continuing	
BX7: Low Earth Orbit (LEO) Satellite Capability	-	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing	Continuing	

A. Mission Description and Budget Item Justification

The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, DoD, commercial space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities, and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.

The LEO Satellite Capability is now called the LEO Battle Management Command, Control (BMC2) and Ground Infrastructure. The BMC2 and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond-Line-of-Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at echelon to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing/s (APNT/S) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.

FY2024 base funding in the amount of \$38.851 million provides prototyping, experimentation, and risk reduction activities for the Army as it continues to develop and field the Tactical Intelligence Targeting Access Node (TITAN) pre-prototypes. TITAN and complimentary AI/ML technologies are assessed via the Army Theater-Level Access Node (ATHENA) ground station architectures. These Advanced Component Development and Prototypes efforts enable ground stations to dynamically task, receive, and disseminate data to directly support live-fire, S2S demonstrations and assessments, enabling wide-area, responsive, and deep-area sensing and force maneuver. Additionally, this funding supports navigation warfare (NAVWAR) technology integration and Positioning, Navigation and Timing (PNT) technology development and assessments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604035A / Low Earth Orbit (LEO) Satellite Capability			
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO
Previous President's Budget		19.638	35.509	39.672	-
Current President's Budget		18.922	35.509	38.851	-
Total Adjustments		-0.716	0.000	-0.821	-
• Congressional General Reductions		-	-		
• Congressional Directed Reductions		-	-		
• Congressional Rescissions		-	-		
• Congressional Adds		-	-		
• Congressional Directed Transfers		-	-		
• Reprogrammings		-0.716	-		
• SBIR/STTR Transfer		-	-		
• Adjustments to Budget Years		-	-	-0.821	-
Change Summary Explanation					
Decreased funding to support higher Army priorities.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army											Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 4					PE 0604035A / Low Earth Orbit (LEO) Satellite Capability				BX7 / Low Earth Orbit (LEO) Satellite Capability				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
BX7: Low Earth Orbit (LEO) Satellite Capability	-	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

In an Army Budget memorandum dated, 21 September 2020, the Army changed the name of this Project from 'Low Earth Orbit (LEO) Satellite Capability' to 'Battle Management Command and Control (BMC2) and Ground Infrastructure for FY22 and beyond.'

A. Mission Description and Budget Item Justification

The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, Department of Defense (DoD), commercial Space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.

The Low Earth Orbit (LEO) Battle Management Command and Control (BMC2) and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at the tactical edge to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.

FY2024 base funding in the amount of \$38.851 million provides prototyping, experimentation, and risk reduction activities for the Army as it continues to develop and field the Tactical Intelligence Targeting Access Node (TITAN) pre-prototypes. TITAN and complimentary AI/ML technologies are assessed via the Army Theater-Level Access Node (ATHENA) ground station architectures. These Advanced Component Development and Prototypes efforts enable ground stations to dynamically task, receive, and disseminate data to directly support live-fire, S2S demonstrations and assessments, enabling wide-area, responsive, and deep-area sensing and force maneuver. Additionally, this funding supports navigation warfare (NAVWAR) technology integration and Positioning, Navigation and Timing (PNT) technology development and assessments.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: LEO Satellite Capability

Description: The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, Department of Defense

	FY 2022	FY 2023	FY 2024
	18.922	34.213	38.851

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Satellite Capability	Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability	
B. Accomplishments/Planned Programs (\$ in Millions)			
(DoD), commercial space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, Assured Positioning, Navigation, and Timing (APNT), deep sensing capabilities, and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat Anti-Access / Area-Denial (A2/AD) forces and enable force projection and maneuver in contested Multi-Domain Operations.	FY 2022	FY 2023	FY 2024
The LEO Satellite Capability is now called the LEO Battle Management Command, Control (BMC2) and Ground Infrastructure. The BMC2 and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond-Line-of-Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at echelon to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing/s (APNT/S) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.			
FY 2023 Plans: Battle Management and Control (BMC2) and Ground Infrastructure (renamed from LEO Satellite Capability) continues the demonstration and validation of ground architecture, evaluating ability to provide wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor-to-Shooter (S2S) timelines. Ground architecture will be evaluated through multiple assessment events including the Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and the Army Futures Command (AFC) Project Convergence. These will provide a realistic operational environment to evaluate the integrated Intelligence, Surveillance, and Reconnaissance (ISR), Positioning, Navigation and Timing (PNT), BMC2, and communications data to identify and locate targets of interest in denied and contested environments actionable by the tactical Warfighter. This will be executed through the S2S Demo/ Experimentation Plan which began with the first Positioning, Navigation and Timing (PNT) Assessment Exercise (PNTAX) in FY19, working through three Live-Fire Exercises and follow-on exercises in Europe and the Pacific, and culminating with a FY 2023 Project Convergence exercise. This Demo/Experimentation cycle is extremely important as it is the Army's mechanism to ensure current and future funding is being correctly applied against the most critical requirements. It provides an iterative framework for rapid concept of operations and tactics, techniques, and procedures development, evaluation and revision and for rapid technology insertion.			
FY 2024 Plans: Battle Management and Control (BMC2) and ground infrastructure continues the demonstration and validation of ground architecture, evaluating the ability to provide wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor-to-Shooter (S2S) timelines. Ground architecture is evaluated through multiple assessment events including the Assured Position, Navigation, Timing and Space (APNT/S) Cross Functional			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023							
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Satellite Capability					Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability								
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2022	FY 2023	FY 2024					
<p>Team (CFT) Campaign of Learning and Army Futures Command's Project Convergence. These provide a realistic operational environment to evaluate the integrated Intelligence, Surveillance and Reconnaissance (ISR), Positioning, Navigation and Timing (PNT), BMC2, and communications data to identify and locate targets of interest in denied and contested environments actionable by the tactical warfighter. This is executed through the S2S demonstration and experimentation plan which began with the first Positioning, Navigation and Timing (PNT) Assessment Exercise (PNTAX) in FY19. PNTAX provides the Army's sole large scale, open air, threat informed Radio Frequency/Global Positioning System denied environment for assessments and experiments necessary to ensure evolution of Multi-Domain Operations and Joint All Domain Command and Control (JADC2) capabilities. Further, APNT/S CFT conducts multiple CONUS-based live-fire exercises along with follow-on embedded experimentation in exercises across US Army Europe- African Command (USEUR-AF) and US Army Pacific Command (USARPAC), culminating with a FY 2024 Project Convergence exercise. Critical to this overall effort are Soldier touchpoints, prototyping and ground architecture development, Artificial Intelligence and machine learning integration, S2S demonstrations to inform space, high altitude, aerial and terrestrial based sensor development, space-based telemetry, Alternative Navigation and radio frequency sensing. This demonstration and experimentation cycle is extremely important as it is the Army's mechanism to ensure current and future funding is correctly applied against the most critical requirements. It provides an iterative framework for rapid concept of operations and tactics, techniques, and procedures development, evaluation and revision and for rapid technology insertion.</p>																	
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$3.342 million from FY23 (\$35.509 million) to FY24 (\$38.851 million) reflects an increased requirement for integration and experimentation of prototypes developed in FY23.										-	1.296	-					
Title: SBIR/STTR Description: Funding transferred in accordance with Title 15 USC §638																	
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638																	
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638																	
Accomplishments/Planned Programs Subtotals										18.922	35.509	38.851					
C. Other Program Funding Summary (\$ in Millions)																	
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost					
• 0603766A: <i>Tactical Electronic Surveillance System - Adv Dev</i>	113.365	72.314	65.567	Base	OCO	Total	65.567	38.537	29.007	29.019	39.343	Continuing					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Satellite Capability			Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability					
C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete Total Cost
Remarks										
Development by Project BX7 'LEO Battle Command and Control (BMC2) and Ground Infrastructure' is in conjunction and complement Project CC5 'LEO ISR'. ref. PE 0603766A.CC5										
D. Acquisition Strategy										
The Army signed a Memorandum of Agreement (MOA) with the Mission Partner on November 19, 2019. This relationship has shown promise to build and deliver capacity for the Army. The MOA will allow the Army to leverage orbit experimental ISR satellites that will accelerate the Army's development of Concept of Operations (CONOPPs), Tactics, Techniques and Procedures (TTPs), and refine requirements necessary to mitigate the deep-sensing gap, shorten the S2S timeline and improve situational awareness for Warfighters at both the operational and tactical levels.										
This funding will enable the Army to utilize on-orbit demonstrations and numerous large-scale exercises within United States European Command (EUCOM) and U.S. Indo-Pacific Command (INDOPACOM) areas of responsibility (AORs). These demonstrations will help define the Army's tactical requirements, CONOPPs, and TTPs for leveraging on-demand/direct link theater access, at echelon, to space-based ISR capabilities with trained/certified Soldiers. This will turn previously "opportunistic" collection into "assured" collection to support dynamic targeting and enhanced situational awareness. It will enable ground stations to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and AFC Project Convergence. Existing Mission Partner contracts and Aviation & Missile Technology Consortium (AMTC) OTAs will be used for Prototype Development, Engineering Services and Test and Evaluation Support.										

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Satellite Capability				Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability								
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Prototype Development and Engineering Services Support	C/FFP	Multiple : Multiple	-	3.214	Oct 2021	6.454	Oct 2022	6.600	Dec 2023	-		6.600	0.000	16.268	-	
SBIR/STTR	TBD	HQDA : Pentagon, Arlington, VA	-	-		1.296	Mar 2023	-		-		-	0.000	1.296	-	
Subtotal		-	3.214		7.750		6.600		-		6.600	0.000	17.564	N/A		
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
LEO Satellite Infrastructure Capabilities Development	C/CPIF	Multiple : Multiple	14.100	11.708	Jan 2022	23.394	Jan 2023	27.280	Jan 2024	-		27.280	0.000	76.482	Continuing	
Subtotal		14.100	11.708		23.394		27.280		-		27.280	0.000	76.482	N/A		
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
LEO Infrastructure Test and Evaluation	C/CPIF	Multiple : Multiple	-	4.000	Jan 2022	4.365	Jan 2023	4.971	Jan 2024	-		4.971	0.000	13.336	-	
Subtotal		-	4.000		4.365		4.971		-		4.971	0.000	13.336	N/A		
				Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			14.100	18.922		35.509		38.851		-		38.851	0.000	107.382	N/A	
<u>Remarks</u>																

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army													Date: March 2023												
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)																	
2040 / 4				PE 0604035A / Low Earth Orbit (LEO) Satellite Capability				BX7 / Low Earth Orbit (LEO) Satellite Capability																	
Event Name		FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027			FY 2028					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BMC2 and Ground Infrastructure																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army			Date: March 2023	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Satellite Capability	Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability		
Schedule Details				
Events	Start	End		
BMC2 and Ground Infrastructure	Quarter 1	Year 2021	Quarter 4	Year 2028